Research Report 1203

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REALTRAIN VALIDATION FOR RIFLE SQUADS II: TACTICAL PERFORMANCE

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U. S. Army
Research Institute for the Behavioral and Social Sciences

March 1979

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SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

(9) 1. REPORT NUMBER: Research Report 1203

2. GOVT ACCESSION NO.

3. RECIPIENT'S CATALOG NUMBER

(6) 4. TITLE *(and Subtitle)*: REALTRAIN VALIDATION FOR RIFLE SQUADS II: TACTICAL PERFORMANCE

5. TYPE OF REPORT & PERIOD COVERED: --

6. PERFORMING ORG. REPORT NUMBER: --

(10) 7. AUTHOR(s): Larry L. Meliza, Thomas D. Scott and Kenneth I. Epstein

8. CONTRACT OR GRANT NUMBER(s): --

9. PERFORMING ORGANIZATION NAME AND ADDRESS
U.S. Army Research Institute for the Behavioral and Social Sciences
5001 Eisenhower Avenue, Alexandria, VA 22333

(16) 10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: 2Q763743A773, 2Q763743A775

11. CONTROLLING OFFICE NAME AND ADDRESS
U.S. Army Training Support Center, TRADOC
Fort Eustis, VA 23604

(11) 12. REPORT DATE: March 1979

13. NUMBER OF PAGES: 156

14. MONITORING AGENCY NAME & ADDRESS *(if different from Controlling Office)*: -- (12) 164 p.

15. SECURITY CLASS. *(of this report)*: Unclassified

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE: --

16. DISTRIBUTION STATEMENT *(of this Report)*

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

-- (14) ARI-RR-1203

18. SUPPLEMENTARY NOTES

--

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Engagement simulation
Tactical training
REALTRAIN
Simulation techniques
Training systems
Infantry training
Performance-oriented training

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

A field experiment was carried out to determine the relative effectiveness of REALTRAIN (which is an engagement simulation training system) and conventional training. Rifle squads were given a tactical pretraining test, 3 days of training using either REALTRAIN or conventional methods, a post-training test, and finally a series of tactical exercises in which REALTRAIN and conventional squads opposed one another. Data collected on the behavior of squads during engagements were shown to be related to end-product measures

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DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

408 010

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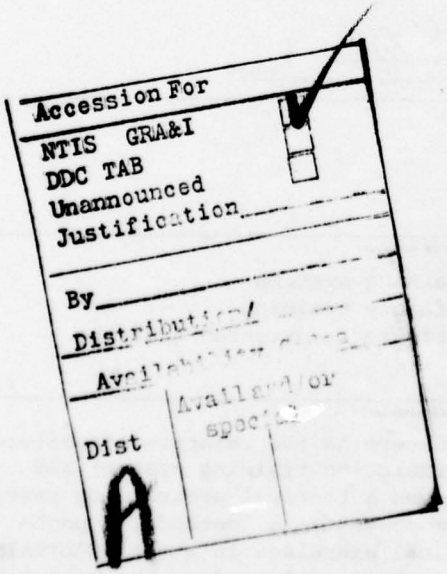
of tactical performance. Resulting tactical performance data, as well as mission accomplishment and casualty exchange data, indicate that REALTRAIN is more effective than conventional field training in the training of rifle squads.



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Office, Deputy Chief of Staff for Personnel
Department of the Army

March 1979

Army Project Number
2Q763743A773
2Q763743A775

Tactical Team Performance

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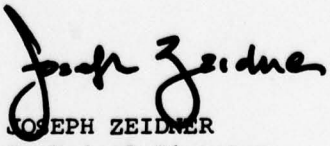
FOREWORD

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) has developed a broad program for more effective training of combat units in the Army. The U.S. Army Training and Doctrine Command (TRADOC) has identified small unit tactical engagement simulation training as one of its highest behavioral science research priorities. One product of ARI's research program is a tactical engagement simulation training method, known as REALTRAIN, which provides extremely realistic and motivating training for small combat-arms units. ARI Technical Report S-4 and ARI research Reports 1191 and 1192 describe this method.

To validate REALTRAIN, ARI has projected a series of field tests supported by personnel of the ARI Presidio of Monterey Field Unit, Jack J. Sternberg, Chief. This report, one of a series, presents part of the findings of an experiment conducted at Fort Ord, Calif., in May 1977. The ARI core team, in addition to the authors, included James H. Banks (Test Director) and Guthrie D. Hardy, Jr., of the ARI Field Unit at Presidio of Monterey, and Robert H. Sulzen, F. H. Steinheiser, Jr., and MAJ Shelton E. Wood of the ARI Engagement Simulation Technical Area.

LTC Thomas J. Ritenour of the ARI Field Unit at Presidio of Monterey organized and supervised the military support aspects of the field tests. Without LTC Ritenour's outstanding contribution and the support of the 7th Infantry Division, this research could not have been accomplished. Special thanks go to CPT Douglas L. Hawkins, 3/32 Infantry; COL George J. Stapleton, TRADOC Systems Manager for Tactical Engagement Simulation (TSM-TES); and LTC Larry Word and CPT Donald Loftis, Office of TSM-TES, for their support and encouragement.

This research was conducted within the December 1976 Five Year Test Program (FYTP) as approved by the Army Test Schedule and Review Committee (TSARC). The entire program is responsive to the requirements of Army Projects 2Q763743A773 and 2Q763743A780 and the TRADOC TSM-TES of the U.S. Army Training Support Center, Fort Eustis, Va. The research reported here was conducted as part of Army Project 2Q763743A775.



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REALTRAIN VALIDATION FOR RIFLE SQUADS II: TACTICAL PERFORMANCE

BRIEF

Requirement:

To compare and evaluate the tactical performance of rifle squads trained with REALTRAIN engagement simulation methods and rifle squads trained by conventional combat field training methods.

Procedure:

In Phase I, 18 rifle squads of nine men each from the 7th Infantry Division at Fort Ord, Calif., engaged in a pretest field exercise to establish pretraining performance levels. This pretest included a movement-to-contact and attack against a four-man outpost, and a hasty defense against a skilled squad-size opposition force.

Phase II provided 3 days of carefully coordinated training by REALTRAIN methods for nine squads and by conventional methods for nine squads.

Phase III, the posttest, repeated the pretest on different terrain to establish performance improvement after training.

In Phase IV, each squad conducted two attacks and two defenses against squads of the other training group (shootoff exercise).

Findings:

Results were assessed in terms of mission accomplishment, casualties exchanged, and intermediate tactical performances.

All squads performed at similar levels during pretraining tests. In posttraining tests, conventionally trained squads showed little improvement over pretraining test performances. In contrast, REALTRAIN squads showed large improvements on all three types of measures. Moreover, performance on intermediate tactical tasks was highly correlated with casualty data.

Utilization of Findings:

Results from this portion of the field assessment of REALTRAIN provide empirical evidence, gathered under a systematic and comprehensive field research program, of the greater effectiveness of REALTRAIN over conventional combat unit training for infantry rifle squads. The Army uses REALTRAIN methods now; these methods will form the core of a total engagement simulation system for training and evaluation. Moreover, results of this study constitute a major step toward the development of improved ARTEPs.

REALTRAIN VALIDATION FOR RIFLE SQUADS II: TACTICAL PERFORMANCE

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REALTRAIN VALIDATION FOR RIFLE SQUADS II: TACTICAL PERFORMANCE

INTRODUCTION

Improvement of tactical training is one of the Army's highest priorities. In recent years, the Army has sought to increase the effectiveness of unit training through the introduction of the Army Training and Evaluation Program (ARTEP). The major thrust of ARTEP increases emphasis on development of performance-oriented training and evaluation methods. The current ARTEP stresses that unit proficiency be judged on the basis of performance of the appropriate missions, performed with as much tactical realism as possible. The ARTEP also attempts to set forth training objectives and standards in explicit performance terms.

The ARTEP initially suffered from some critical weaknesses; one was the inability to objectively determine terminal mission outcomes. However, the introduction of tactical engagement simulation training methods such as SCOPES,[1] REALTRAIN,[2] and eventually, the Multiple Integrated Laser Engagement System (MILES) has alleviated this problem. Using these methods, commanders have the capability to conduct two-sided, free-play tactical exercises with credible casualty assessment and weapons signature effects, and a high degree of realism. A second major weakness in the ARTEP is a general superficiality, which results in inadequate guidance for Army trainers. For example, evaluation of the engagement phase of the rifle squad movement to contact/meeting engagement (ARTEP 7-15), specifies only that "within a reasonable time, squad eliminates enemy resistance using fire . . . and maneuver without sustaining excessive casualties." If a unit fails to accomplish its mission, this general guidance gives the trainer no help in determining reasons for failure. In further ARTEP development, trainers should receive improved guidance in diagnosing specific training deficiencies, so that they can better design an effective, efficient training program.

ARI and TRADOC are conducting a research program to improve Army tactical training and evaluation. This program includes the development of tactical engagement simulation training methods, such as REALTRAIN and MILES, and provides a basis for improving existing ARTEPs. The use of improved ARTEPs and the employment of advanced

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[1] SCOPES: Squad Combat Operations Exercise (Simulation); ST 7-2-172, U.S. Army Infantry School, 1973.

[2] REALTRAIN: Tactical Training for Combined Arms Elements; Army Training Circular, TC 71-5, January 1975.

engagement simulation tactical training methods offer to greatly improve readiness of combat units. Not only will trainers be able to determine objectively the terminal mission outcomes (e.g., mission accomplishment and casualty exchange ratios), but they also will be assisted in determining proficiency on critical intermediate tasks (e.g., use of suppressive fire and use of overwatch[3]). Consistent with the performance-oriented, criterion-referenced approach, critical intermediate tasks are defined as those that substantially increase the probability of mission accomplishment. The steps to identify these tasks are (a) identification of candidate intermediate tasks; (b) development of objective measures of proficiency for these tasks; (c) determination of the test conditions necessary to gather these data reliably; (d) correlation of intermediate task proficiency with mission outcomes; and (e) identification of those tasks which correlate most highly with mission outcomes. The payoff from this research should be empirical identification and validation of critical intermediate tasks as well as determination of objective measures. These measures of task proficiency and measurement procedures can be incorporated into the ARTEP.

Two field experiments (one with rifle squads[4] and one with Armor/Anti-Armor teams[5]) have been conducted to compare the relative training effectiveness of REALTRAIN and conventional training methods not employing engagement simulation. The tactical tests used to compare the training methods were based on current ARTEPs but were greatly expanded to permit detailed analysis of tactical performance. The present paper, one of the series of reports based on these experiments, examines a variety of measures of engagement-related tactical performance for rifle squads in the attack and in the defense. Other topics, e.g., movement techniques, will be explored in subsequent papers.

METHOD

The field experiment consisted of four phases of tactical training and performance testing. Players consisted of 18 nine-man squads from the 7th Infantry Division at Fort Ord, Calif. Phase I was a tactically realistic pretraining test administered to establish

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[3] In overwatch, either fire team is in a position to protect the other fire team by firing on the enemy observation post.

[4] Described in this report and in Banks, J. H., et al., REALTRAIN validation for rifle squads: Mission accomplishment. ARI Research Report 1192, October 1977.

[5] Scott, T. D., Meliza, L. L., Hardy, G. D., Jr., Banks, J. H., & Word, L. E. REALTRAIN validation for armor/anti-armor teams. ARI Research Report 1204, March 1979.

entry-level tactical proficiency and to establish the equivalence of squads to be trained either by REALTRAIN or by conventional methods.

Phase II consisted of a 3-day training period during which squads received either REALTRAIN or conventional training. Phase III was a posttraining test, conducted to determine the performance increments resulting from training. Finally, Phase IV consisted of two-sided, free-play engagements in which REALTRAIN and conventionally trained squads opposed one another in a series of attack-defense missions.

Pretraining and posttraining tests (Phases I and III) consisted of a movement-to-contact and a hasty attack against an outpost, followed by a hasty defense against an opposition force. The scenario for these tests was based on guidance provided in ARTEP 7-15 but was greatly augmented to encompass the large number of performance measures required for fine-grain performance analysis.

The test scenario included occupation of an assembly area, movement to contact, reaction to contact and attack, and a hasty defense. Two test lanes were selected so that terrain was as similar as possible and so that tactical realism was maintained. Each squad was administered the pretraining test on one lane and the posttraining test on the other. In addition, order of lane use in pretests and posttests was counterbalanced to minimize any possible lane effects.

Participants in the exercise were permitted to use M16A1 rifles, M60 machineguns, practice handgrenades, smoke handgrenades, and practice claymore mines. No mortar or artillery was played. Tested squads were initially given a movement to contact mission in which they encountered and subsequently attacked an enemy observation post (OP).

The OP consisted of an M60 machinegun team and two riflemen in well-prepared, dug-in positions. Thus, the force ratio in this attack was approximately 2:1. The terrain in front of the OP was relatively open, thus providing excellent fields of fire and a decided advantage to the defending opposition force (OPFOR).

In a subsequent portion of the scenario, the tested squads conducted a hasty defense against a 10-man OPFOR squad which included an M60 machinegun team. The OPFOR attacked along a predetermined and well-concealed avenue of approach on the flank of the tested squad. Although the overall force ratio in the hasty defense was approximately 1:1, the brunt of the OPFOR attack was concentrated against one of the tested fire teams, which more nearly resulted in a 2:1 attack defense ratio. Because of the concealment along this selected avenue of approach, the terrain generally favored the attacking force (OPFOR).

Prior to the test, the OPFOR was given several days of collective training using REALTRAIN to bring the force to a high level of tactical proficiency. They also were given experiment-specific training to insure that their attacks and defenses during the pretraining and posttraining tests presented a standardized threat. The test conditions presented extremely difficult objectives for the tested squads.

RESULTS

REALTRAIN squads showed a dramatic improvement across a variety of performance measures following 3 days of tactical training. In contrast, conventionally trained squads showed little improvement following training. The performances of REALTRAIN and conventional squads were similar during pretraining tests. More specifically, during posttraining tests, REALTRAIN squads performed better than conventionally trained squads during the attack in that they

- Accomplished more missions;
- Inflicted more casualties;
- Sustained fewer casualties;
- Used cover and concealment more effectively;
- Were more likely to use overwatch;
- Were more likely to use suppressive fire;
- Were more likely to employ the M60 machinegun;
- Were more likely to use the M60 machinegun to cover the maneuvering element;
- Used handgrenades more effectively;
- Were more likely to attack the more vulnerable approach (flank) to the OP;
- Were more likely to be actively controlled by a leader; and
- Were more likely to perform as an integrated unit.

Similarly, REALTRAIN squads performed better than conventionally trained units during the defense in that they

- Accomplished more missions;
- Inflicted more casualties;

- Sustained fewer casualties;
- Were more likely to use an OP;
- Were more likely to deploy to cover their more vulnerable flank;
- Were more likely to place claymore mines to cover the most likely route of enemy advance;
- Made fewer and less basic errors in employment of claymore mines;
- Were more likely to make early detections of the OPFOR; and
- Were more likely to open fire before the OPFOR.

Thus, REALTRAIN units showed a dramatic improvement in tactical performance during posttraining tests and were far superior to conventional squads. In addition, performance on intermediate tasks was highly correlated with terminal mission outcome.

CONCLUSIONS

The results have shown that REALTRAIN training can dramatically increase the tactical proficiency of rifle squads. The quality of tactical performance improved across a broad range of measures, and performance on intermediate tasks was closely related to mission outcomes.

Present rifle squad ARTEPs do not provide a substantial amount of guidance for trainers to diagnose specific training deficiencies. The data collection methods and measures, discussed in detail in the technical supplement, provide a basis for the development of an improved generation of ARTEPs. Many of the measures discussed herein are relevant to the improvement of training and evaluation methods for rifle squads and also may be generalized to larger units (platoons and companies). For example, use of overwatch, delivery of suppressive fire, command and control are general intermediate processes which are not solely linked to the tactical performance of rifle squads. Thus, the information in this report not only indicates the substantial benefits obtainable from REALTRAIN engagement simulation training, but also leads to development of improved ARTEPs.

TECHNICAL SUPPLEMENT

METHOD

The research was conducted at Fort Ord, Calif., during March, April, and May 1977, to validate REALTRAIN training methodology and to identify critical measures of tactical performance for infantry rifle squads. Player and support personnel were supplied by the 7th Infantry Division at Ford Ord.

Eighteen infantry squads underwent a program of tactical testing and training for a period of 2 weeks each. Squad performance was evaluated during ARTEP-based tactical tests against a standard opposition force before and after training. In addition, following post-training tests, units trained by REALTRAIN and by conventional methods opposed one another in a series of attack-defense missions (shootoffs). REALTRAIN casualty assessment methods were used during testing and shootoffs. Measures of tactical performance included both terminal product and process types.

Personnel

Army test personnel were assigned duty positions based on their individual qualifications. Participants included data collectors, controllers, radiotelephone operators (RTOs), training officers and noncommissioned officers (NCOs), and support personnel. The integrity of player squads, assigned to the test by the 7th Infantry Division, was maintained during the test. Scientific staff members monitored all phases of testing and training to insure that test procedures and scenarios were accurately replicated. The members also collected data on some aspects of performance.

Players and OPFOR. Players were members of 18 rifle squads from the 7th Infantry Division. Each nine-man squad was composed of a squad leader, two fire team leaders, four riflemen, and a two-man M60 machinegun team. The OPFOR was similarly organized except that it contained 1 additional rifleman, making a 10-man squad. In addition, two riflemen functioned as OPFOR along the tactical test lanes.

Controllers/Data Collectors. REALTRAIN controller staff consisted of four officers and two NCOs. During periods of the tactical test when an engagement was not in progress, these controllers functioned as data collectors. Other data collectors were two civilian scientists and seven enlisted men. The civilian scientists, officers, and four enlisted men formed two controller/data collection teams which allowed tactical tests to overlap in time and which permitted two shootoff exercises (REALTRAIN vs. conventionally trained units) to be executed concurrently.

Test Personnel Training

Controller/Data Collectors. All controller/data collectors and civilian scientists were trained in their duties and became familiar with the tactical scenario and test lanes during the week before the test. During this period, practice exercises on the test lanes were carried out to verify the feasibility of executing the tactical scenario, to establish realistic test lane boundaries, and to insure that all controller/data collectors were able to carry out their duties accurately and reliably.

OPFOR. The OPFOR was given several days of tactical training using REALTRAIN prior to the pretraining and posttraining tests to bring the force to a high level of tactical proficiency. Much of this training was experiment-specific and conducted on the test lanes to insure that the OPFOR attacks and defenses during the pretraining and posttraining tests were executed in a tactically proficient and standardized manner.

Test Design

Schedule. The field experiment consisted of four phases of tactical training and performance testing, replicated in three cycles. Each cycle consisted of the testing and training of six rifle squads during a 2-week period (see Table 1).

Table 1

Chronological Sequence of Events Within a Cycle

	Week 1					Week 2				
	Day				Day				Day	
	1	2	3	4	5	1	2	3	4	5
Training in REALTRAIN procedures			Training							
Pretest						Posttest			Shootoffs	

Phase I was an ARTEP-based pretraining test administered to establish entry-level tactical proficiency and to establish the equivalence of squads to be trained by REALTRAIN and by conventional methods. The test consisted of two missions: a movement to contact/attack on a

prepared position and a hasty defense. Test squads were opposed by a trained and standardized opposition force. Three squads were tested each day. Upon completion of Phase I, the six squads were ranked in terms of their judged tactical proficiency and assigned to either REALTRAIN or conventional training groups. Rankings were based upon military judgment made by field grade (O4) Infantry officers, and supplemented by such readily determinable objective data as casualties sustained and inflicted. In each cycle, three squads were assigned to each training group in such a manner as to balance and equalize, as much as possible, the entry-level proficiency of the squads in the training groups. During the three cycles, nine squads received REALTRAIN training and nine squads received conventional training.

Phase II consisted of a 3-day training period during which squads received either REALTRAIN or conventional training. Two highly experienced and accomplished Infantry officers (both captains) trained the squads: one with REALTRAIN, the other with conventional methods. Both trainers were given the same training guidance (based on ARTEP 7-15), and both independently developed a 3-day program of instruction (POI) for the attack and hasty defense missions. Each POI was reviewed and discussed with the trainer to insure that the two POIs were comparable and both trainers were training on the same missions, tasks, and conditions. Conduct of training was monitored to insure that the POIs were followed. However, as long as the trainers stayed within the generally broad limits of the approved POI, they were allowed to adjust their training to meet the particular needs of the squads that they were training.

With the exception of REALTRAIN controllers, the same materiel training resources, terrain, and personnel were available to both trainers. Controllers are personnel required for casualty assessment in a REALTRAIN exercise but not required in conventional exercises.

Phase III consisted of a posttraining tactical performance test--the same as that administered during Phase I except that it was conducted on a different test lane.

Phase IV consisted of tactical exercises in which REALTRAIN and conventionally trained units opposed one another. Each unit conducted two attacks and two defenses against squads of the other training group. The full tested squad (nine men) was employed in the attack. Defenses, however, consisted of four riflemen (a fire team leader and three riflemen) chosen by the squad leader. The fire team was assigned to defend predesignated, prepared (dug-in) defensive positions. The force ratio for these exercises was approximately 2:1. The terrain on both shootoff lanes provided concealed avenues of approach for the attacking force and somewhat restricted fields of fire for the defenders.

Pretests and Posttraining Tests. Phase I and II tactical performance tests consisted of a movement to contact/attack, followed by a hasty defense. The scenario for these tests was based on the guidance provided by ARTEP 7-15 but was greatly expanded in order to accommodate the large number of performance measures required for detailed performance analysis.

Two test lanes were used, and each squad was administered the pretraining test on one lane and the posttraining test on the other. The order of lane use in pretests and posttests was counterbalanced to minimize any possible lane effects. The two lanes covered similar terrain, which was moderately wooded with designated routes of advance lying along clearly identifiable ridge lines. Lane boundaries were placed so that squads had adequate freedom to maneuver yet were constrained to move generally along the ridge lines.

Major events in the tactical scenario consisted of occupation of an assembly area, movement, reaction to a potential threat, crossing a danger area, reaction to an enemy observation post (OP) and an attack on that OP, and the setup and conduct of a hasty defense. Appendix A includes a sketch map of one of the lanes (Lane 2).

1. Assembly Area. Upon arrival at a test lane, the squad leader was informed that he was to occupy tactically a squad sector of a platoon perimeter and was given the boundaries of his area of responsibility. After the squad had occupied its position, the squad leader was given an operations order by the senior controller, who simulated the platoon leader. The squad leader was given 15 minutes to brief his men and prepare to cross the line of departure (LD). The orders and maps given to the squad leaders are presented in Appendix B.

2. Potential Threat. Shortly after having crossed the LD, the squad passed an abandoned position that showed signs of recent activity (i.e., fresh dirt and new sandbags placed around a foxhole). In the position there was a map pouch containing a map of the local area with "enemy" dispositions indicated. The squads' reactions to this potential threat were documented.

3. Danger Area. After passing the potential threat, squads were required to cross a clearly hazardous "danger area" consisting of a clearing bisected by an unimproved road. On the far side of the danger area two riflemen occupied concealed positions, located so that they could observe the squad as it approached the danger area. These "snipers" served two functions: first, they documented a squad's use of cover and concealment as it approached the danger area; second, they forced the squad to deploy, by firing 3- to 5-round bursts of M16 rifle fire at 10- to 12-second intervals for 2 minutes, or until each sniper had been declared a casualty. Fire was commenced once the first squad member had crossed the danger area road. If the snipers were not declared casualties after 2 minutes, they withdrew,

moving by bounds, along a predesignated path which ran obliquely to their rear and off the test lane. No squad casualties were assessed during this engagement. However, snipers did indicate the number of squad members detected prior to anyone's crossing the danger area.

4. The OP. Farther along the course, the tested squads encountered an enemy OP manned by an M60 machinegun team and two M16 riflemen. The force ratio for this encounter was thus approximately 2:1. The OP consisted of well-prepared, dug-in, and camouflaged positions. The relatively open terrain in front of the OP provided excellent fields of fire and a decided advantage to the defending OPFOR. If the squads did not take the OP under fire before crossing a point approximately 50 m from the OP, the squad was taken under fire by the OPFOR defenders. The senior OPFOR controller was responsible for insuring that this rule was followed.

The engagement continued until either (a) the tested squad had only one survivor, (b) the OPFOR had all been declared casualties, or (c) either side became sufficiently suppressed or disorganized that continuation of their mission was not feasible. The civilian scientist and the senior controller jointly determined the outcome(s).

After the engagement, an administrative break was called and squads were reconstituted, resupplied, and issued new REALTRAIN helmet numbers. The squads then moved administratively to the site of the hasty defense.

5. Hasty Defense. At the site of the hasty defense, squads received a fragmentary (frag) order (see Appendix B) to set up a squad section of a platoon defensive perimeter, to be completed within 15 minutes. Because of environmental constraints, squads were not allowed to dig-in their positions or to damage local foliage to acquire material for camouflage. However, they were allowed to use downed wood or other similar material they could find at the defensive site. Tested units were allowed to deploy for the defenses as they thought best, as long as they remained within lane boundaries. If squads chose to employ an OP, the OP was not allowed to select a position farther forward than 50 m from the designated defensive site; this constraint prevented compromising of the OPFOR assembly area. After 15 minutes, the 10-man OPFOR squad (including an M60 machinegun team) began to move against the defensive position. The OPFOR attacked along a predetermined and well-concealed avenue of approach on the flank of the tested squad. Despite the fact that the overall force ratio in the hasty defense was approximately 1:1, the main thrust of the OPFOR attack was concentrated against one of the tested unit fire teams. The result was more nearly a 2:1 attack-defense ratio. Moreover, because of the concealment afforded the OPFOR along their routes of advance, the terrain favored the attacking unit.

The hasty defense exercise was terminated when either (a) the OPFOR had only one survivor; (b) the tested unit had only one survivor; or (c) either unit was sufficiently disorganized, or suppressed, that continuation of their mission was not feasible. These determinations were made jointly by the civilian scientist and the senior controller.

Materiel, Weapons, and Ammunition. All players arrived at the test site with their weapons and a tactical radio (AN/PRC-77). Prior to the tactical test movement to contact/attack, each tested unit rifleman was issued 140 rounds of blank 5.56 ammunition and three practice handgrenades, and each machinegun team was issued 400 rounds of blank 7.62 ammunition and six practice handgrenades. Each squad also received six smoke grenades. In addition, all players were issued REALTRAIN equipment, consisting of helmet covers bearing a 3-inch, 2-digit number, 6-power telescopes for M16 riflemen, and a pair of 7x50 binoculars for each machinegun team.

Prior to the hasty defense, squad members were allowed to replenish their ammunition and pyrotechnic supplies up tc the limit stated above. In addition, each squad was issued two M18A1 practice claymore mines and was allowed to draw, if desired, one TA312 field telephone with field wire.

During training periods, training ammunition was issued daily. Both training groups (REALTRAIN and conventional) received grenade simulators, smoke grenades, 5.56 blank rounds, 7.62 blank rounds, practice claymores, and practice grenades. Also, REALTRAIN units received the REALTRAIN equipment listed above.

Squad Training. The tactical test employed REALTRAIN rules of engagement. The ability to inflict casualties under REALTRAIN rules of engagement partially depends on the ability to identify two-digit helmet numbers using a 6x telescope mounted on the M16 rifle. Therefore, all player squads were given extensive training in the use of telescopes and numbers for inflicting casualties prior to the administration of pretests. This training was necessary to permit meaningful casualty assessment in the pretest, as well as to insure that subsequent differences in tactical proficiency between training groups were not due to a difference in the ability to utilize the telescopes and numbers themselves.

REALTRAIN and conventional squads received 3 days of tactical training following the pretest. During this period, two training areas were rotated between groups so that each had equal access to the terrain. Training areas were separated from testing areas. All training and testing areas had similar terrain.

On each training day, a civilian scientist or an Infantry officer was assigned to each training group to monitor the content and method of training. These training monitors also insured that conventional squads were not trained using actual or approximations of the REALTRAIN methods.

Rules of Engagement. The rules of engagement were generally those contained in TC 71-5: REALTRAIN: Tactical Training for Combined Arms Elements, and in ST-7-2-172: SCOPES: Squad Combat Operations Exercise (Simulation).

All players were identified by 3-inch-high, 2-digit numbers on helmet covers. When a controller declared a player a casualty, the player was ordered to remove his helmet and lie down at his position. Controllers insured that players who had been declared casualties did not become reinvolved in the engagement.

Casualties could be inflicted by the simulated use of (a) the M16, (b) the M60 machinegun, (c) handgrenades, or (d) claymore mines. No indirect fire was played during any portion of the test. Controllers used specific criteria to assess casualties, and the procedure and criteria for assessing casualties differed as functions of the types of weapons employed. These weapons are briefly described below.

1. M16 Rifle. In order to inflict a casualty with the M16, a rifleman must fire his M16 and call out the helmet number of the target. The firer must also be pointing his M16 toward the target when he fires. The controller checks a list of numbers in the opposing squad to insure that number called is valid. If no such number is in the exercise, the controller tells the player that he "missed." If the number is valid, the controller transmits the numbers of the firer and of the target over the control radio net, and the controller nearest the target player informs the player that he has been declared a casualty. That player then removes his helmet and takes no further part in the problem. Target and firer helmet numbers along with weapon type and time of the casualty are recorded at the net control station (NCS).

2. M60 Machinegun. The casualty assessment procedures and criteria used with the M60 machinegun are similar to those used with the M16. The M60 must be fired in the direction of the target when a target helmet number is called out. Instead of using a 6x telescope to identify target helmet numbers, the assistant machinegunner uses binoculars. Casualties may thus be "inflicted" by the joint action of the machinegunner and the assistant machinegunner. If the machinegunner becomes a casualty, he is prohibited from firing, carrying the weapon or ammunition, or performing other combat functions, but he may identify target helmet numbers when the assistant machinegunner fires. The NCS logs all casualties.

The M60 machinegun may also be used to provide suppressive fire. When the gun is firing, the nearest controller determines its direction of fire and reports the information over the control radio net. For example, if the machinegun fire is oriented toward the left flank of the opposing force position, the controller calls "Suppression, left flank" over the radio; if the fire is directed at the smoke cloud from a smoke grenade, the controller calls "Suppression, smoke." The controller on the opposite side determines whether any opposing force personnel are in the area and informs them they are receiving fire, e.g., "Suppression, fire team bravo." If any player in the area receiving fire then remains exposed or attempts to move without cover, he is assessed a casualty.

3. Handgrenade. Players within five paces of an exploding practice handgrenade and not in a covered position are declared casualties. The controller on the receiving end of the grenade transmits the casualty report to the NCS.

4. Claymore Mine. The player sets up the practice claymore mine, and the controller determines the casualty-producing radius. The size of the fan depends on the placement and aiming of the claymore. All controllers in the exercise (in this case, both OPFOR and tested unit controllers) are familiarized with the locations and aiming of emplaced claymores. The blast effect of the mine is simulated by a blasting cap and a grenade simulator buried behind the mine and is triggered by a player with a firing device. Exposed personnel within the casualty-producing radius are declared casualties and are reported to the NCS.

Data Collection. A wide range of data was collected during the course of the experiment. During the tactical testing periods, four test staff members collected data while accompanying the tested unit; three collected data while stationed along the test lane; two collected data while located with the OPFOR; and two staff members, remotely located, collected data from radio traffic. The data collection procedures are documented in the test operations scenario (Appendix C).

1. Tested Unit Data Collection. Two officers, one civilian scientist, and one enlisted man collected data while accompanying the tested units. The senior controller (controller 1) traveled with the lead fire team; the second controller (controller 2) traveled with trailing fire team; and the civilian scientist (data collector) accompanied the squad leader. The enlisted man followed the squad, staying as far behind the squad as terrain and foliage density permitted, and was responsible for constructing maps of squad movements and positions. All movements of data collectors and controllers were tactical, and care was taken to insure that staff members did not compromise either movements of or positions occupied by the tested squads. Controllers 1 and 2 collected data only when an engagement was not in progress; during engagements, they functioned as controllers only. Data forms and maps appear in Appendix D.

2. Test Lane Data Collection. Three enlisted men collected data on tested squads along the test lanes. One, positioned near the assembly areas, collected data on the squads' use of cover and concealment as they occupied the assembly area. The other two, the "snipers" stationed at the danger area, collected data on the manner in which the squad approached the danger area.

3. OPFOR Data Collection. Two NCOs collected data on tested squads from the OPFOR point of view. These men (controllers 3 and 4) were stationed at the OPFOR OP during the attack module and moved with the OPFOR during their attack on the tested unit's hasty defensive position; however, they did not collect data during the defense module.

4. Remote Data Collection. Two enlisted men, located at the experimentation control center (ECC), collected data from radio traffic. One of these operated the NCS and recorded all data regarding casualties and data on scenario events (e.g., time of crossing control phase lines). The other monitored the tactical net and recorded reports from the tested squad. Appendix D contains data forms.

5. Narrative Data. Upon completion of an exercise, the senior controller debriefed the OPFOR controllers. After returning to the ECC, the tested unit controllers and the civilian scientist constructed a narrative of the exercise. Narratives included a detailed description of the events in the exercise, beginning with the occupation of the assembly area and ending with the hasty defense. These narrative sessions were tape-recorded and subsequently transcribed and edited, to be used to supplement and verify information provided by data forms and maps. For a typical narrative, see Appendix E.

Experimentation Site

The experimentation site consisted of two tactical test lanes, two shootoff test lanes, two training areas, and an ECC. The ECC, located between the two tactical test lanes, provided a centralized area for arrival and departure of troops; issue and turn-in of ammunition and materiel; issue and collection of data forms; and remote data collection.

The experimentation site terrain was generally uniform and comprised of moderately wooded, small hills with some open depressions.

Communications

Communications among controllers and between controllers and the NCS were made via AN/PRC-77 tactical radios. Communications between tested squads and a simulated platoon headquarters located at the ECC also employed AN/PRC-77s but used a separate frequency. Other

test staff data collectors used small, two-channel commercial ("walkie-talkie") radios to communicate among themselves and with the ECC.

RESULTS

Mission accomplishment and casualty data were presented in Banks et al. (1977). Further analysis is presented herein, and the content is primarily directed toward developing an understanding of the dynamics of rifle squad engagements. Several factors that contribute to success in battle are examined. Results are presented in four major sections. The first briefly reviews the casualty and mission accomplishment data presented in Banks et al. (1977). The second section discusses squad performance in the attack. The third examines squad performance in the defense. The fourth summarizes and discusses measures across both missions.

Because of personnel problems, the data from two tested units are not presented. Key squad members were missing from one conventional and one REALTRAIN squad during the scheduled posttest. Therefore, the results presented here are for eight REALTRAIN and eight conventionally trained squads.

Section 1: Success in Engagements

Two principal measures for success in battle are mission accomplishment and casualties inflicted and sustained. The performances of the REALTRAIN and conventional training groups on these measures are briefly described in this section. More detailed results are contained in the previously cited report.

Mission Accomplishment. Mission accomplishment, the prime goal of any combat unit, is defined here as the complete destruction or neutralization of an opposing force. More specifically, for the attack on the OP, the tested squad was considered to have accomplished its mission when the OPFOR defenders were either (a) all declared as casualties or (b) fully suppressed. The tested squad was considered to have failed in the attack on the OP when only one man in the squad was left "alive" or when the squad was so disorganized or suppressed that it could not continue the attack. Rules for mission accomplishment in the Phase IV shootoff were the same.

For the hasty defense, the tested squad was considered to have accomplished its mission when only one OPFOR attacker remained "alive" or when the attackers were so disorganized or suppressed that they could not continue the attack. The tested squad was considered to have failed in its defense when only one defender remained "alive" or when the defenders were so disorganized or suppressed that no effective defense was offered.

Because of the difficulty of the attack and the defense missions in the tactical tests, none of the tested units accomplished either of their missions during the pretraining tests. Following 3 days of tactical training, however, some tested units showed a markedly improved capability for successfully executing their missions (see Figure 1). REALTRAIN units were successful in 50% of their attacks and 75% of their defenses. In contrast, conventionally trained squads showed no great improvement, succeeding in only a single defense.

Units were compared with respect to the number of missions accomplished as a function of training group and test. The interaction between training group and test was statistically significant at the $p < 0.005$ level. REALTRAIN units demonstrated a significant ($p < 0.05$; Tukey's HSD Test) improvement following training, and the number of missions accomplished was greater for REALTRAIN units than for conventional units ($p < 0.05$; Tukey's HSD Test; see Appendix F). The effect of training on mission accomplishment for conventional units was not significant. The data from shootoff exercises are consistent with these results (Figure 2). In the shootoff exercises in which REALTRAIN and conventional units directly opposed each other, REALTRAIN units were successful in 67% of their attacks and 82% of their defenses. Conventional units, on the other hand, were successful in 18% of their attacks and 33% of their defenses ($p < .05$; χ^2).

Casualties. Casualty data collected during these engagements are consistent with the mission accomplishment data. In the attack, REALTRAIN squads showed greater improvement following training than did conventional squads (see Tables 2 and 3). The mean number of casualties sustained by the REALTRAIN squads decreased from 7.9 to 6.1 ($p < 0.05$; Tukey's HSD Test), and the casualties sustained by the conventional squads (8.0 to 7.8 for pretest and posttest, respectively) basically did not change. The mean number of casualties inflicted on the OPFOR increased from 0.4 to 2.4 ($p < .05$; Tukey's HSD Test) for the REALTRAIN group but changed very little (.3 to .6) for the conventional group.

Table 2

Mean Number of Casualties Sustained by Tested Squads in the Attack on the OP

	Training method	
	RT	CT
Pretest	7.9	8.0
Posttest	6.1	7.8

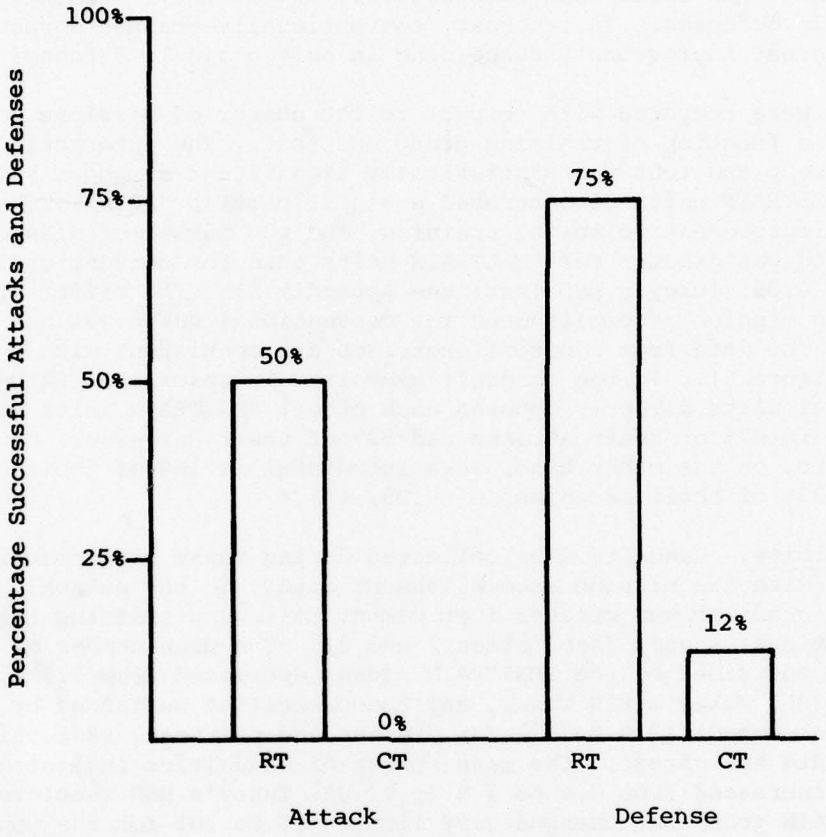


Figure 1. Posttraining mission accomplishment for REALTRAIN and conventional units: attack and hasty defense.

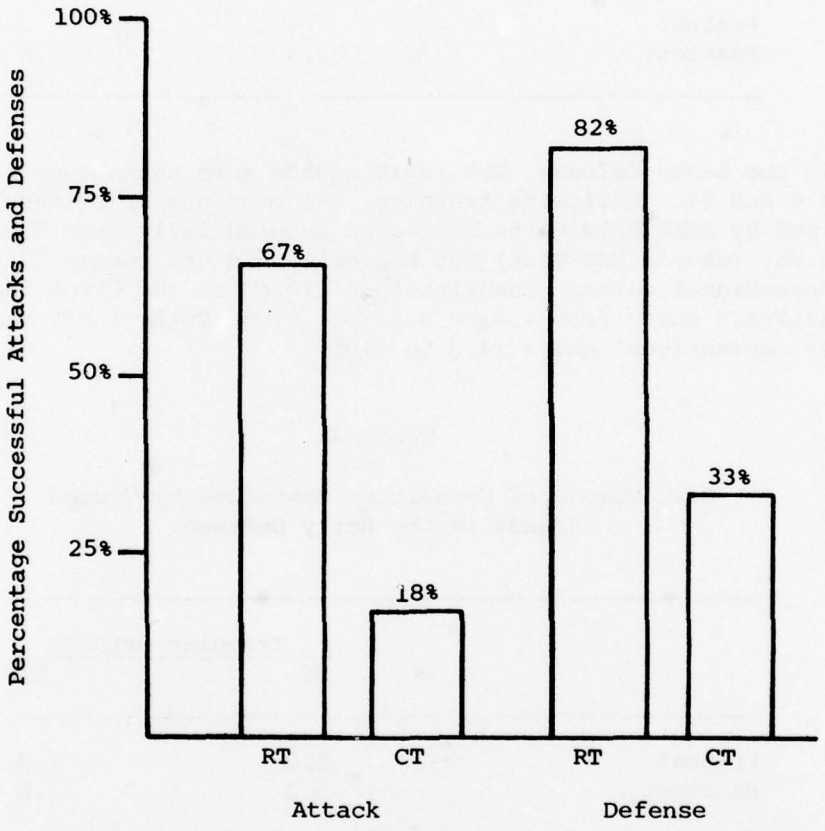


Figure 2. Percentages of successful attacks and defenses by REALTRAIN and conventionally trained units during shootoff trials.

Table 3

Mean Number of Casualties Inflicted on OPFOR in the Attack on the OP

	Training method	
	RT	CT
Pretest	.4	.3
Posttest	2.4	.6

In the hasty defense, REALTRAIN squads were again superior (see Tables 4 and 5). Following training, the mean number of casualties sustained by REALTRAIN units decreased substantially from 8.0 to 5.3 ($p < 0.05$; Tukey's HSD Test) but basically did not change (7.9 to 7.6) for conventional units. Casualties inflicted on the OPFOR increased for REALTRAIN units from 4.4 to 8.5 ($p < 0.05$; Tukey's HSD Test) but not for conventional units (4.3 to 4.0).

Table 4

Mean Number of Casualties Sustained by Tested Squads in the Hasty Defense

	Training method	
	RT	CT
Pretest	8.0	7.9
Posttest	5.3	7.6

Table 5

Mean Number of Casualties Inflicted on OPFOR in the Hasty Defense

	Training method	
	RT	CT
Pretest	4.4	4.3
Posttest	8.5	4.0

These results are also supported by those from the shootoff exercises (Table 6). In the attack, REALTRAIN squads sustained fewer casualties (4.6) than did conventional squads (6.9) ($p < .025$; one factor ANOVA). The results for the defense were similar: 1.7 versus 2.8 casualties sustained for REALTRAIN and conventional squads, respectively ($p < .05$; one factor ANOVA). As REALTRAIN and conventional units opposed one another in these exercises, the casualties sustained by one training group were inflicted by the other. For example, where conventional units were in the defense, they sustained an average of 2.8 casualties and inflicted 4.6 casualties on the REALTRAIN units, for a casualty exchange ratio of 1.64 attackers "killed" for every defender "killed." However, when REALTRAIN units were in the defense, the exchange ratio was 4.06 attackers "killed" for every defender "killed."

Table 6

Mean Number of Casualties Sustained by Tested Squads in Shootoff Attacks and Defenses

	Training method	
	RT	CT
Attack	4.6	6.9
Defense	1.7	2.8

In summary, following training, REALTRAIN squads accomplished more of their missions while sustaining fewer casualties and inflicting more casualties than did conventional squads. Granted that the performance of REALTRAIN squads was superior to that of conventionally trained squads, the following analyses are directed toward identifying the squad actions which produced that superior performance.

Section 2: Attack

For the attack, some factors which contributed to success will be analyzed in terms of temporal characteristics of the engagement, initial response to contact, tactical development of the engagement, and the assault.

Temporal Characteristics of the Engagement. Analysis of the temporal characteristics of engagements may reveal important information about patterns of combat. In this research, the casualty distribution, over time, shows differences between REALTRAIN and conventional units that suggest why REALTRAIN units were successful in their attacks, whereas conventionally trained units were unsuccessful.

The most apparent difference was the time that tested units took to execute the attack; that is, difference in the time from first inflicted casualty to last inflicted casualty, on either side (Figure 3). During pretests, attacks lasted an average of slightly over 15 minutes for both groups. In sharp contrast, following training, REALTRAIN units took a mean time of 49 minutes to execute their attacks. Conventional units showed only a small increase (to 22 minutes mean time) in the duration of their attacks following training. The change from pretest to posttest was significant for the REALTRAIN group ($p < .05$; Tukey's HSD Test) but not for the conventional group. The posttest difference between the groups was also significant ($p < .05$; Tukey's HSD Test).

These data on duration of the engagement suggest that, following training, REALTRAIN squads may have been more cautious in their attacks than conventional squads. This interpretation is supported by other evidence. During the attacks, controller/data collectors were in the firing positions with the OPFOR riflemen and machinegun team and were, therefore, in excellent positions to observe, from the "enemy" point of view, how the tested squads conducted their attacks. They evaluated the "cautiousness" of the squads on a 7-point scale from "1: extremely cautious" to "7: extremely careless." Figure 4 shows that in the pretest both groups were about equal and tended to be rated somewhat careless, with mean ratings of 4.8 for REALTRAIN and 4.6 for conventional squads. After training, REALTRAIN squads showed a large increase in caution (rating of 2.7) and conventional squads a smaller decrease in caution (rating of 5.6). The change from pretest to posttest was significant for the REALTRAIN group ($p < .05$; Tukey's HSD Test) but not for the conventional group.

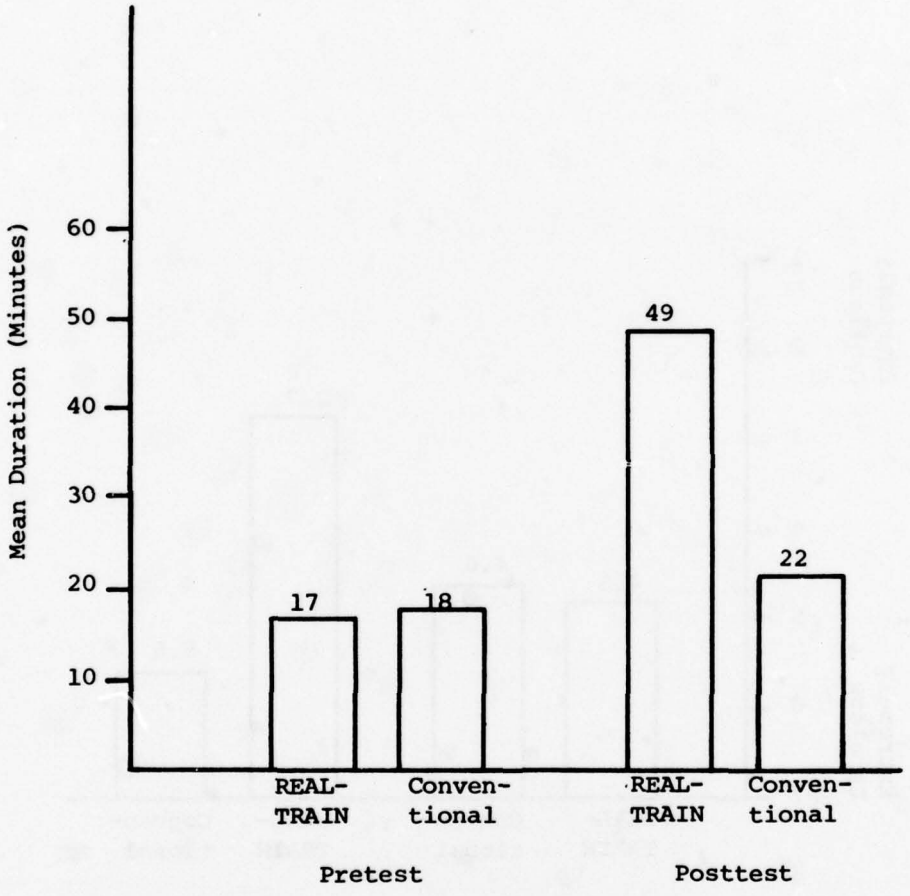


Figure 3. Duration of the engagement at the OP.

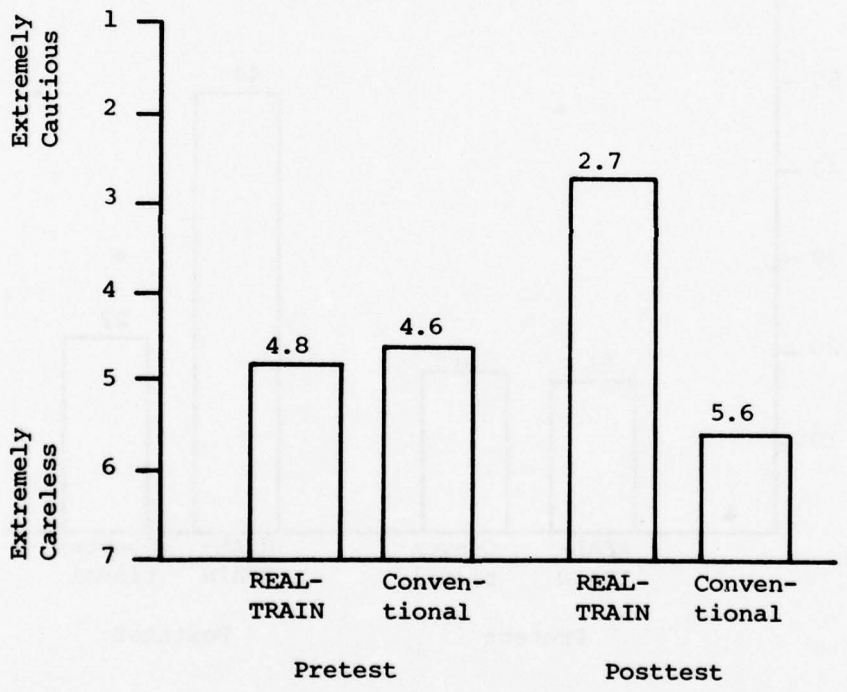


Figure 4. Evaluation by OPFOR controllers of caution shown by tested squads: attack on OP.

The longer duration of the engagements and the evidence of greater cautiousness on the part of the REALTRAIN squads strongly suggest that these squads were more deliberate in their attacks than conventional squads. If so, the rate at which squads sustained casualties should show a marked decrease following training for REALTRAIN squads but not for conventional squads.

Figures 5 and 6 present the cumulative percentage of tested squad casualties over time for conventional and REALTRAIN units, respectively. There are no substantial differences among the REALTRAIN pretest and the conventional pretest and posttest curves. The REALTRAIN posttest curve, however, shows that after training this group sustained casualties at a substantially reduced rate.

Figure 7 shows an enlargement of the REALTRAIN and conventional casualty rate curves for the first few minutes of the attack, during posttraining tests. At the end of the first 5 minutes of the engagement, REALTRAIN squads had sustained approximately 18% casualties, and conventional squads had sustained more than twice that amount, approximately 37% casualties. The casualties in the conventionally trained group in the first 5 minutes were so high that the capability for mounting a successful attack was much reduced. These results show that the events occurring in the first few minutes of an engagement may be major determinants of outcome.

Initial Response to Contact. Because the conventional squads suffered such a debilitating level of casualties in the first few minutes of the engagement, whereas the REALTRAIN squads did not, it is important to determine how the initial response to contact by these groups differed. One possibility, suggested by the increased cautiousness of the REALTRAIN squads and supported by informal observations by controllers and data collectors, is that upon contact REALTRAIN units were more likely to pause and plan their attack than were conventionally trained units. Narrative data and data forms were screened to determine the accuracy of these observations.

One item recorded during the attack asked whether, when contact was initiated, the squad "stalled in place for several minutes." These data, presented in Figure 8, indicate that during posttraining tests, 63% of REALTRAIN squads "stalled," compared with 25% of conventional units. This item was originally intended to measure lack of aggressive squad performance; however, an interpretation indicating a deliberate pause or halt by the tested units is not unwarranted.

Data derived from exercise narratives also support this interpretation. These data indicate that the initial response to contact of 88% of the conventional squads was to continue to move forward toward the OP. None of the REALTRAIN squads responded in this manner upon contact: 50% of the REALTRAIN squads paused so that leaders could confer, and in another 38%, the squad leader ordered elements to set

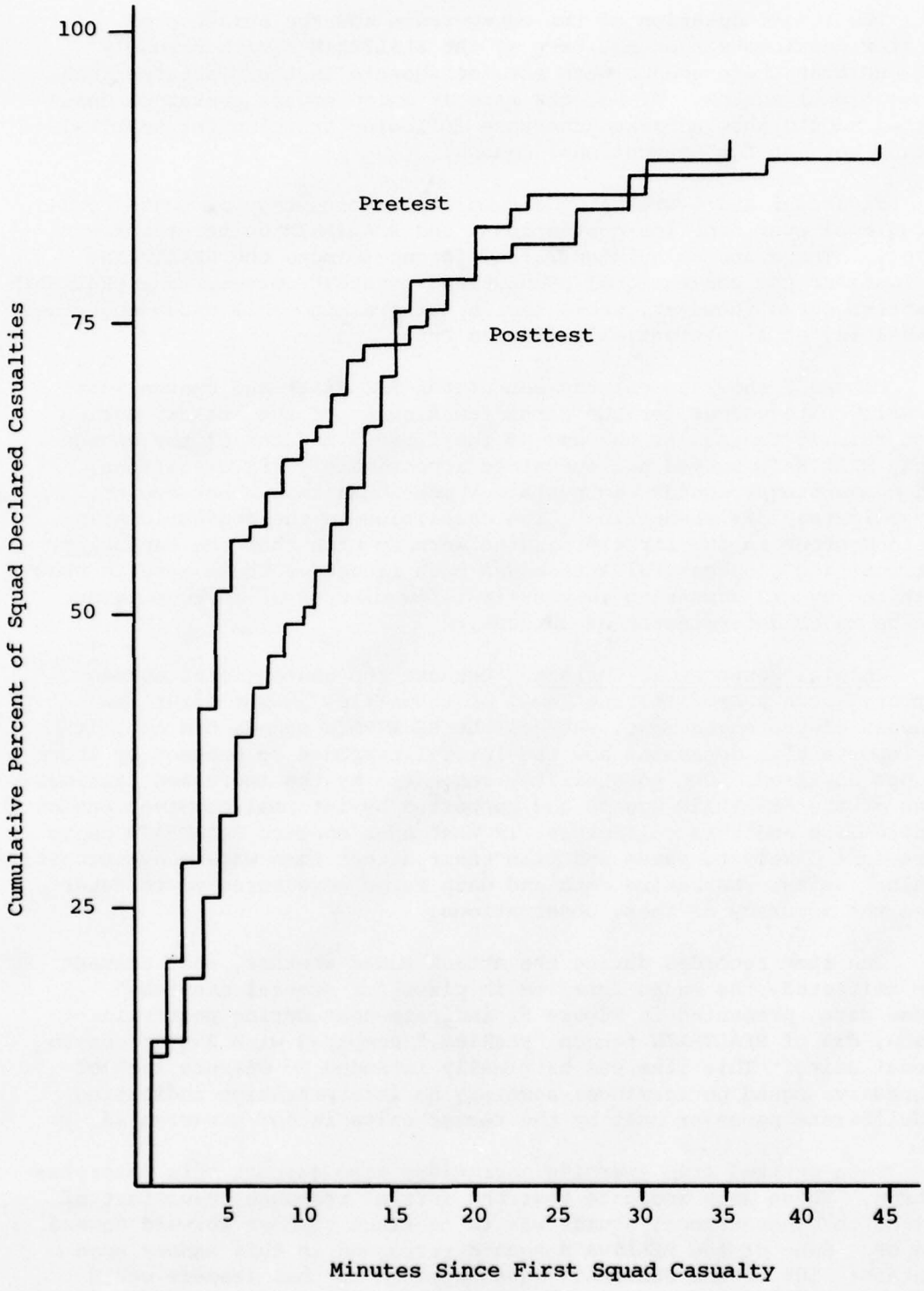


Figure 5. Cumulative percentage of conventionally trained squads declared casualties over time in attack on OP.

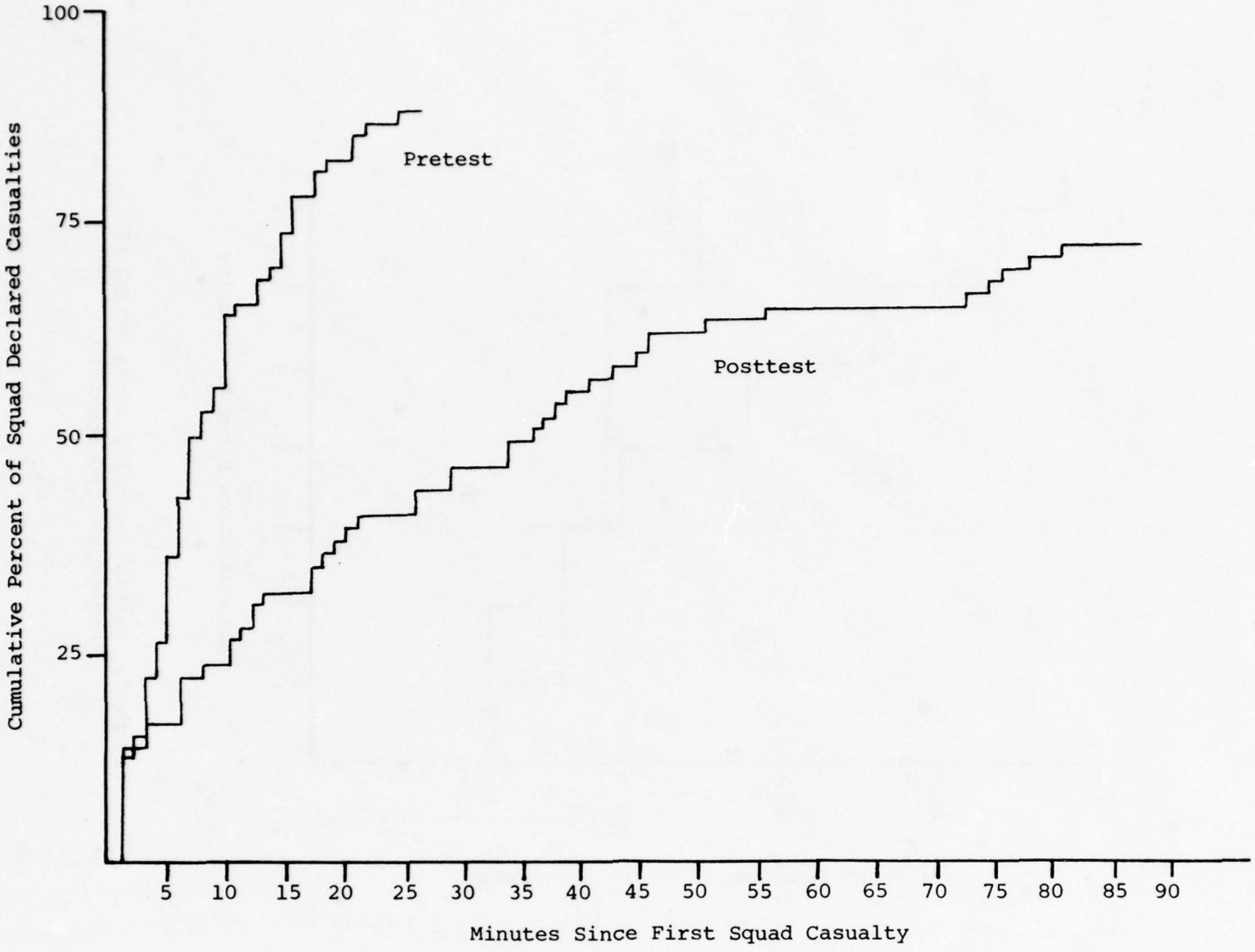


Figure 6. Cumulative percentage of REALTRAIN trained squads declared casualties over time in attack on OP.

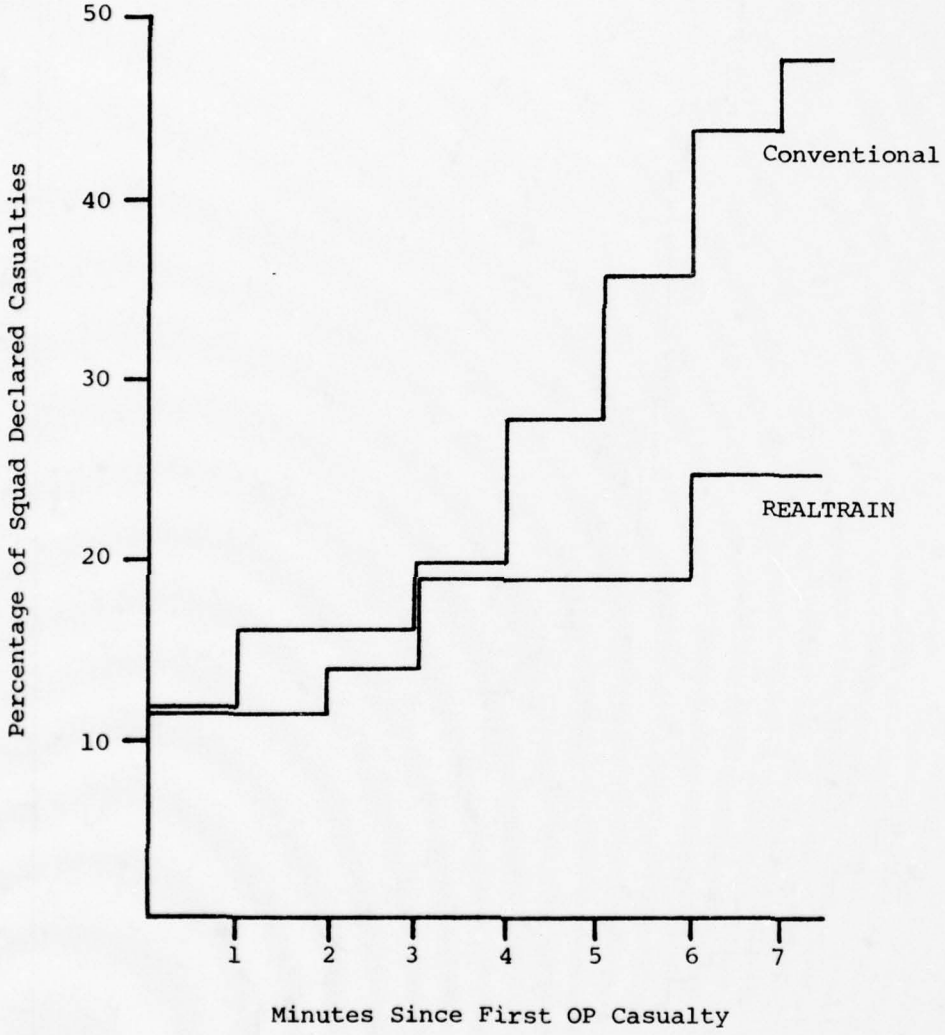


Figure 7. Initial casualty rates during OP engagement (posttest).

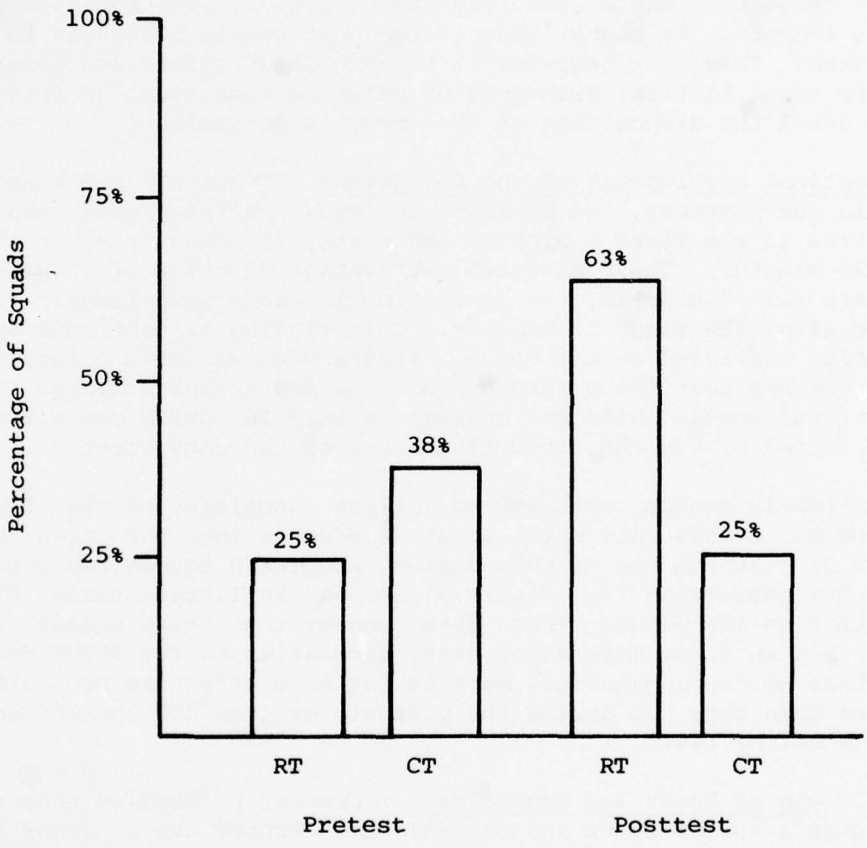


Figure 8. Percentage of squads who "stalled in place," at the initiation of the engagement at the OP.

up a base of fire and prepare to maneuver. In the remaining REALTRAIN squad, the squad leader ordered a return of fire and then pulled his squad back toward the rear. These data indicate that none of the REALTRAIN units continued the movement forward toward the OP immediately upon initiation of contact, while seven of the eight conventional units did continue forward without benefit of a pause to assess the tactical situation and to organize for the attack.

These initial actions by the squads are very probably major determinants of their subsequent success or failure in the attack. If, during the initial stages of the attack, a unit attempts to minimize its own casualties while assessing the situation, its probability of success is apt to be higher than if the unit simply continues to press the attack. Thus, the behavior of the REALTRAIN squads was consistent with the sound tactical principle of delaying commitment of friendly forces until the disposition of the enemy is determined.

Tactical Development of the Engagement. Figures 5 and 7 showed that, in the posttest, the conventional squad suffered more than 35% casualties in the first 5 minutes and nearly 75% casualties in the first 15 minutes. Thus, although the average duration of these engagements was 22 minutes, the conventional squads were largely ineffective after the first 15 minutes. This finding is confirmed by the casualties inflicted on the OPFOR. Figure 9 shows OPFOR casualties during the posttest, as a function of time and training group. The conventional squads' attacks resulted in only 16% OPFOR casualties--all inflicted within the first 17 minutes of the engagement.

REALTRAIN squads continued to inflict casualties on the OPFOR at a low but steady rate until about 33 minutes into the engagement (Figure 9). At the end of this period, REALTRAIN squads had sustained almost 50% casualties (see Figure 6) and had inflicted nearly 30% casualties on the OPFOR. These data suggest that these squads, although they were not inflicting heavy casualties on the OPFOR during this phase of the engagement, were taking more effective protective measures than they had during the pretest, or than did conventional units in either test.

1. Use of Cover and Concealment. One key protective measure is a squad's use of cover and concealment. Proper use of cover and concealment serves to protect squads from enemy observation and fire while allowing squad members to advance on the defended position before becoming decisively engaged. Figure 10 presents the OPFOR controller/data collectors' evaluations of the tested squads' use of cover and concealment. Following training, REALTRAIN squads showed a significant improvement ($p < 0.05$; Tukey's HSD Test) over their performance in the pretraining test, and demonstrated superior performance in comparison with conventional units ($p < 0.05$; Tukey's HSD Test). The effect of training on performance of conventional units was not significant.

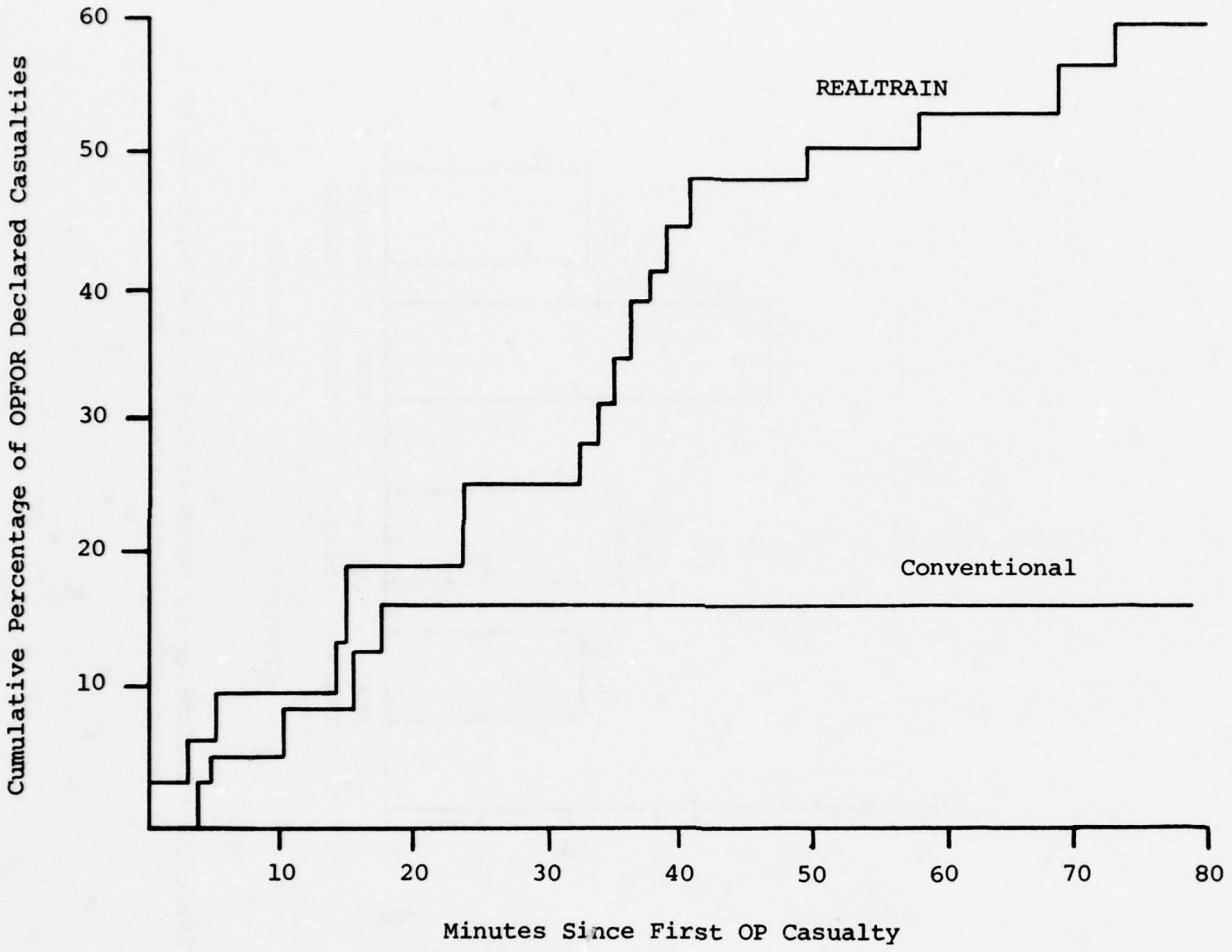


Figure 9. OPFOR casualties as a function of time in the posttest engagement at the OP.

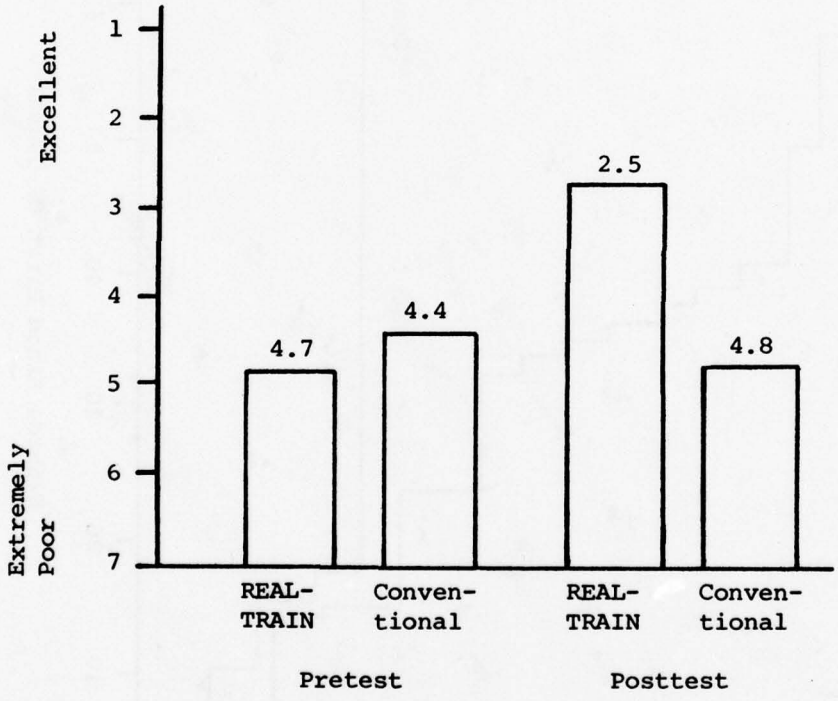


Figure 10. Evaluation by OPFOR controllers of squad use of cover/concealment: attack on OP.

2. Use of Overwatch. Overwatch is defined here as having either fire team in a position to protect the other fire team by delivering fire on the OP. Data collectors/controllers accompanying the squad evaluated, on a yes/no basis, the squads' use of overwatch. Figure 11 presents the tested squads' use of overwatch during the attack. During pretests, neither REALTRAIN nor conventional units employed overwatch to any substantial extent. During posttests, however, 50% of the REALTRAIN units and none of the conventional units employed overwatch.

3. Use of Suppressive Fire. Delivery of suppressive fire by tested units serves a protective function as well as facilitating the squads' ability to maneuver aggressively on the OP. (Rules of engagement for suppressive fire are contained in the Methods section, above.) Data collectors/controllers accompanying the squads also collected this information (Figure 12). During posttests, 100% of the REALTRAIN units employed suppressive fire at the OP, compared with 38% of the conventionally trained units.

Thus, while they developed the tactical situation, the REALTRAIN squads took positive steps to protect themselves to a greater extent than did conventionally trained squads. The REALTRAIN squads made better use of cover and concealment, used overwatch more frequently, and used suppressive fire more often. However, in order to overcome the very well prepared OPFOR position, they would also have to attack aggressively, using the resources they had available.

The Assault. During the engagement, REALTRAIN squads inflicted casualties at a fairly steady rate until about 33 minutes into the attack, when there was a sharp rise in the casualties inflicted on the OPFOR (see Figure 9). At about the same time, the REALTRAIN units also began sustaining a somewhat accelerated casualty rate (see Figure 6). These data probably reflect the casualties exchanged during the assault phase of the attack.

Figure 13 is the cumulative casualty exchange ratio (CER) over time. The figure shows the relative losses by the tested units and the OPFOR at any temporal point during the attack. The CER is equal to the number of casualties in the tested unit divided by the number of OPFOR casualties. Thus, positive-going portions of the curve presented in Figure 13 indicate a CER shift in favor of the OPFOR and negative-going portions indicate a CER shift in favor of the tested unit. (The numbers of casualties in the early moments of engagements by REALTRAIN units during posttests are small, and the CER tends to be unstable. Therefore, the data in Figure 13 present the cumulative CER starting at 15 minutes following the first casualty incurred by either side.)

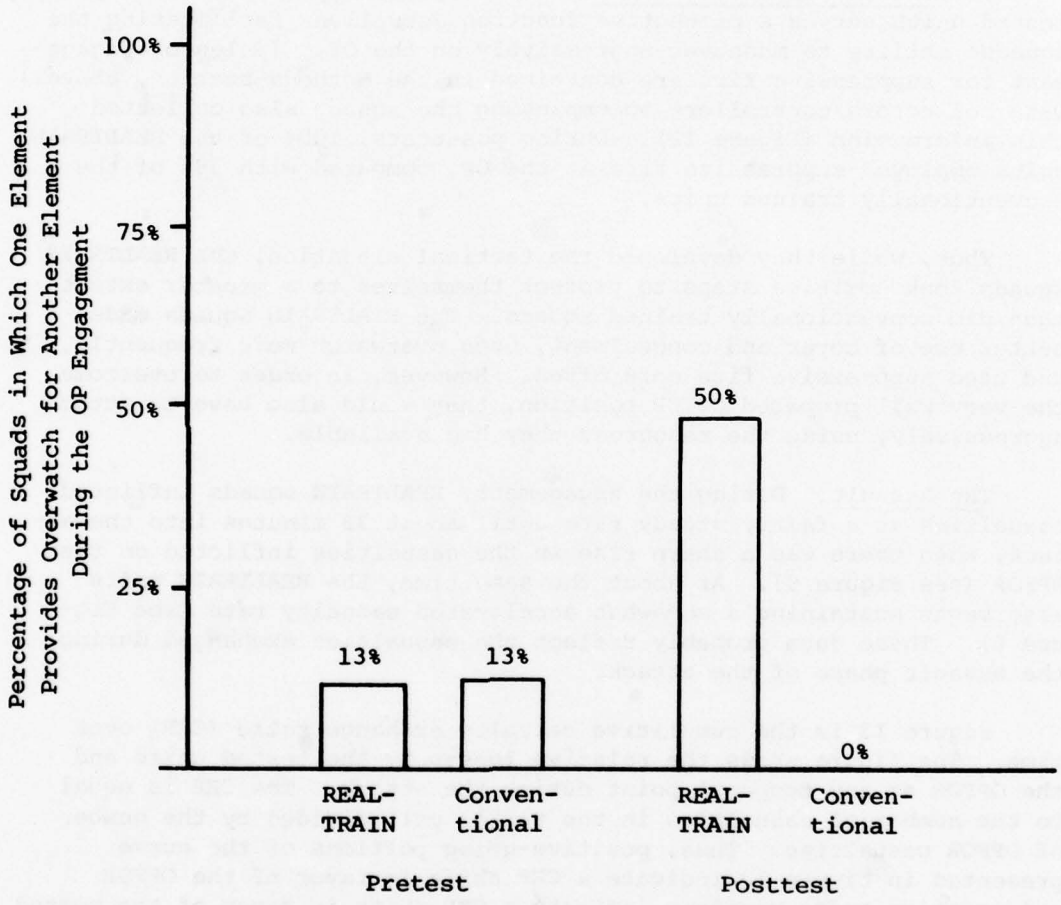


Figure 11. Use of overwatch during the attack on the OP.

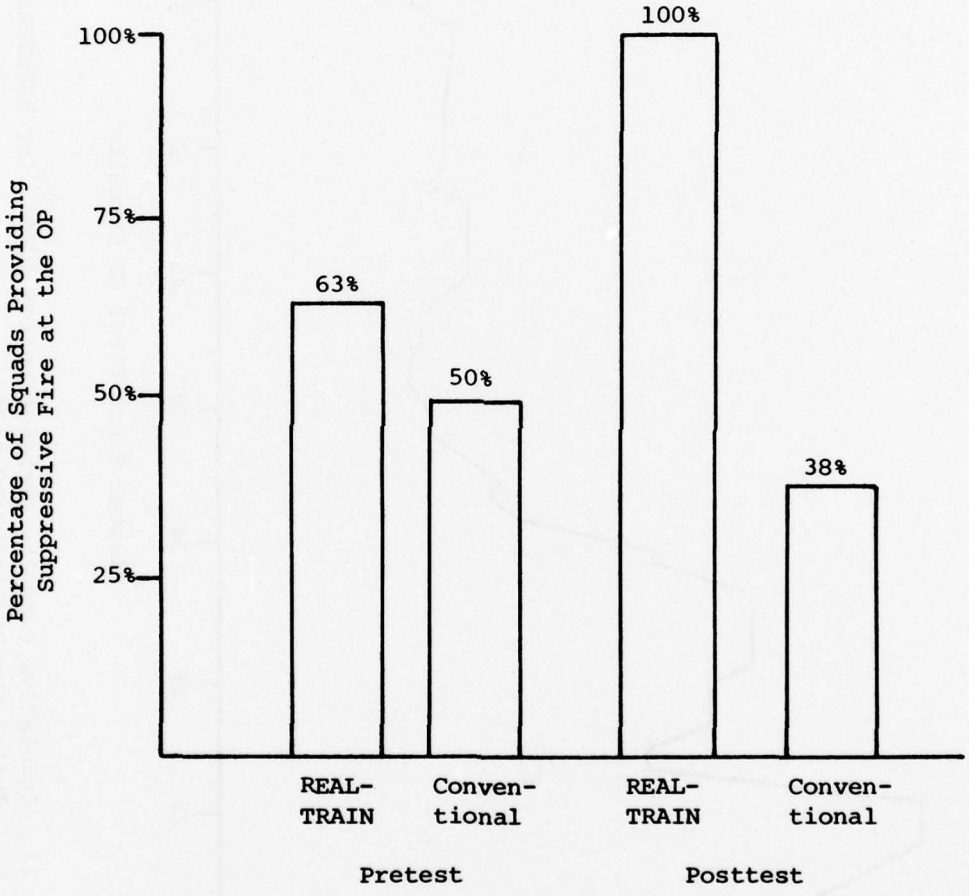


Figure 12. Use of suppressive fire at the OP.

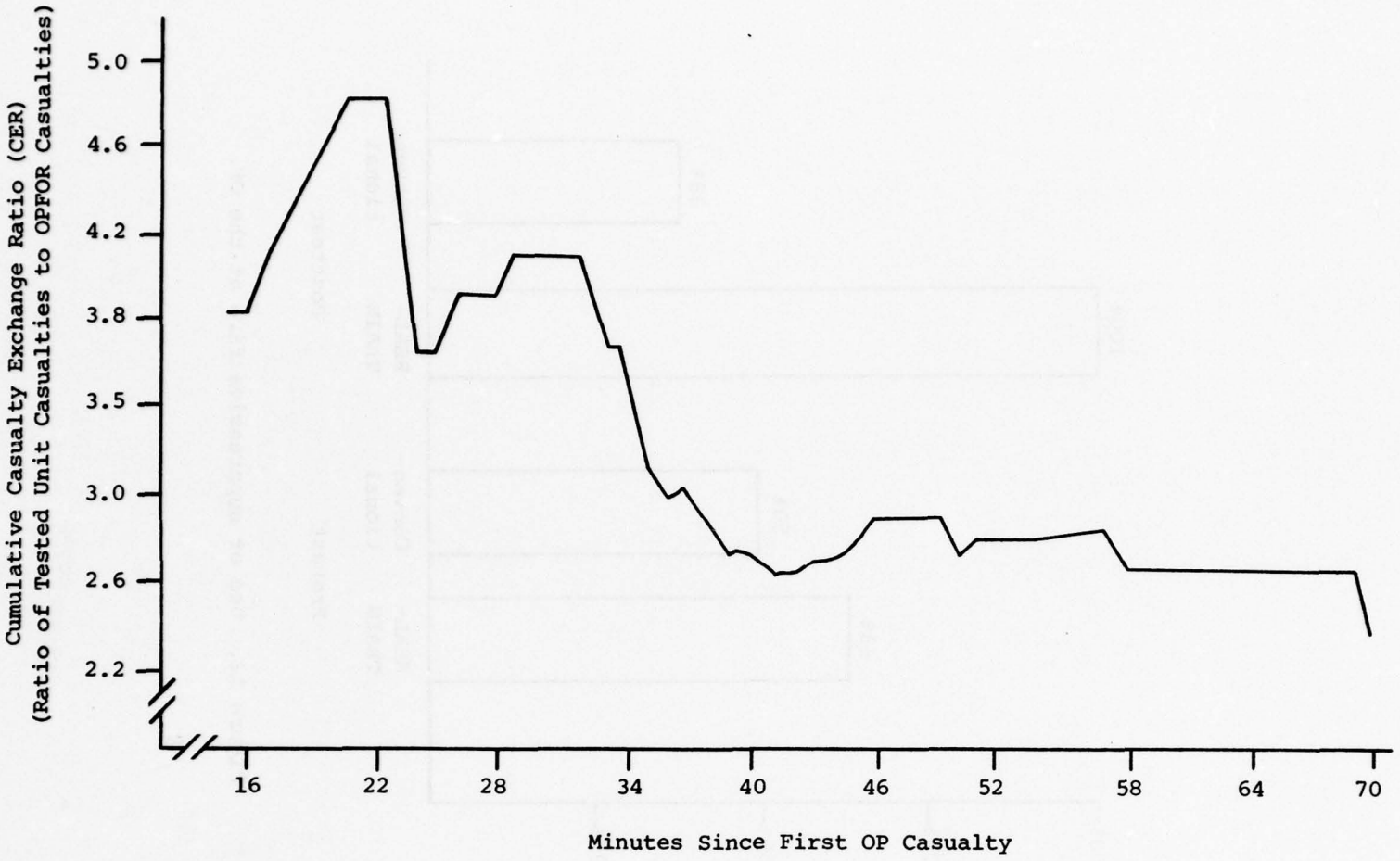


Figure 13. Cumulative casualty exchange ratios (CERs) for REALTRAIN squads during the posttraining tests.

As shown in Figure 13, the cumulative casualty exchange ratio changes sharply and consistently in favor of the REALTRAIN units between 33 and 41 minutes. Also, during this interval the casualty exchange ratio was 1:1. The REALTRAIN units obviously were performing extremely effectively during this portion of the engagement. The data which follow show some of the critical actions that probably contributed heavily to the successful performance of these squads.

1. Use of Weapons. Maximum squad effectiveness is related to the proper employment of all weapons systems available to the squad. Even with the limited number of weapons systems employed in the test, units often did not effectively employ all the resources available to them.

a. Machineguns: During posttraining tests, eight REALTRAIN squads and five conventional squads used the M60 machinegun at the OP. The failure of three conventional squads to use the M60 at the OP appeared to be due to a lack of activities coordination between machinegunners and assistant machinegunners. In two cases, the machinegunner was an early casualty and the assistant machinegunner was unable to assume the role of the machinegunner. In the third case, the assistant had all of the ammunition and became separated from the machinegunner.

b. Grenades: Handgrenades can be extremely effective against a well-prepared, dug-in position. Table 7 presents the casualties inflicted on the OPFOR by weapon type and shows clearly that the REALTRAIN units in the posttest made extensive use of grenades, accounting for half of the OPFOR casualties. As handgrenades are relatively short-range weapons, it is likely that they would not be employed until late in the attack, during the assault. Figure 14 presents the distribution of OPFOR casualties by weapon type during posttests for the REALTRAIN squads. These data show that all grenade casualties occurred after the first 15 minutes of the engagement and that there is a sharp rise between 33 and 41 minutes after the first casualty. As discussed earlier, this sharp rise probably represents the assault phase of the attack. Thus, these results suggest that REALTRAIN units employed handgrenades effectively during the assault. Also, conventional units probably were unable to move within effective handgrenade range and therefore were unable to employ these weapons.

2. Use of Tactics. The tactics employed may also be major determinants of mission success. During pretests, controllers and data collectors noted informally that most units attempted a direct frontal assault on the OP. The result of these engagements was a high, sustained casualty rate among tested units (see Figures 5 and 6). During posttraining tests, however, observers noted that many squads tended to approach the OP from the flanks. This action might give a squad two advantages. First, as the OPFOR OPs were composed of two

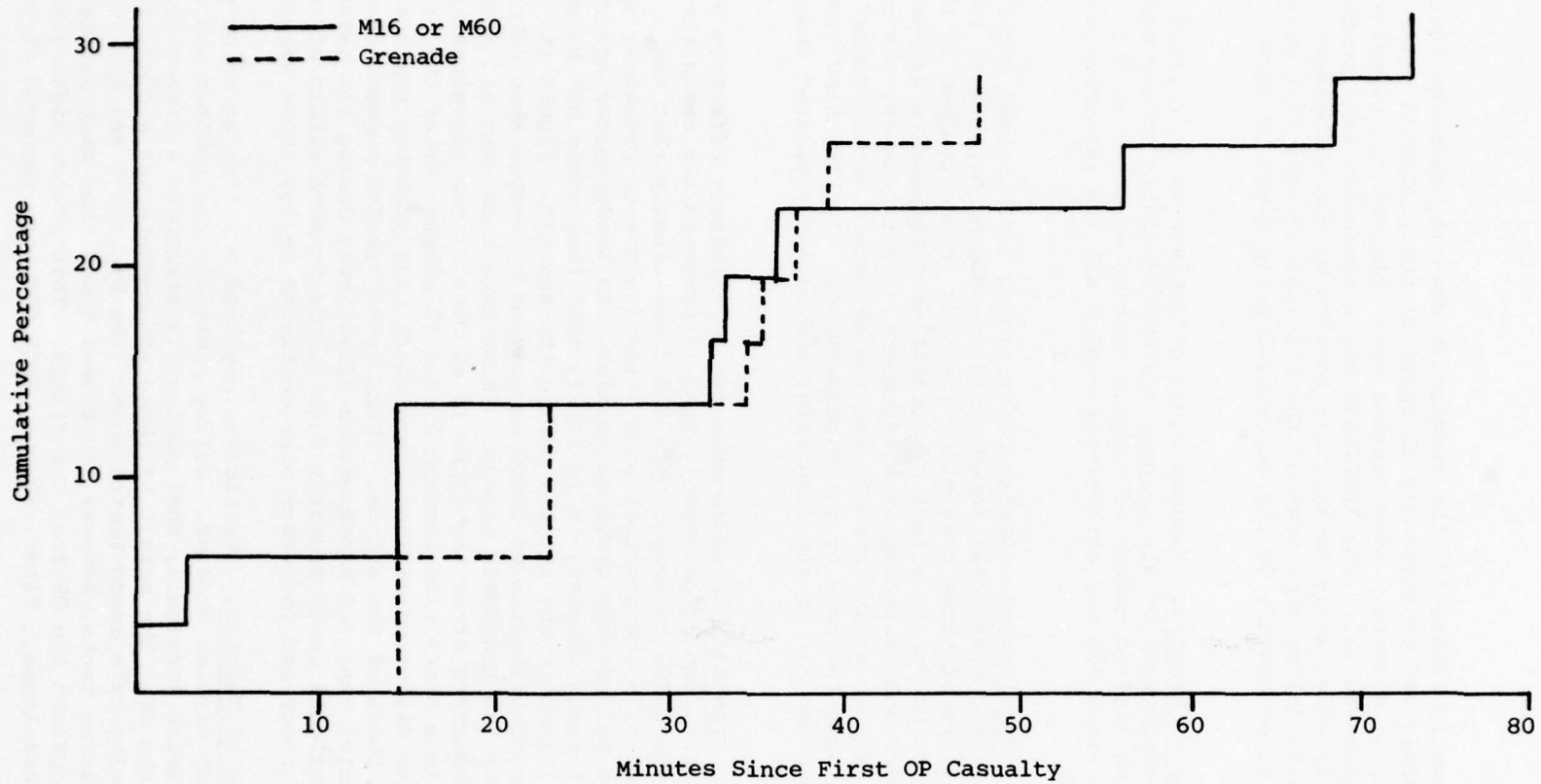


Figure 14. OPFOR casualties inflicted by REALTRAIN squads: by weapon type and time.

side-by-side, dug-in positions, in a flank assault one of these positions would tend to be masked by the other, thus effectively shifting the force ratio more in favor of the attacking unit. Second, the best fields of fire and observation lay along the major avenue of approach to the OP. By attacking the flank of the OP, the defenders' effective fields of fire and observation were substantially reduced. Figure 15 presents the percentage of squads that employed an organized flanking maneuver at the OP.

Table 7

Number of Casualties Inflicted on OPFOR During the Attack, by Weapon Type

	REALTRAIN		Conventional	
	Grenades	M60/M16	Grenades	M60/M16
Pretest	2	1	1	1
Posttest	9	10	2	3

An organized flanking maneuver was defined as an attempt by three or more squad members to flank the OP at the same time. Seven of the eight REALTRAIN squads met the criterion for an organized flanking maneuver during posttest, but only two conventional squads met these criteria. In the pretest, three REALTRAIN squads and three conventional squads made an organized attempt to flank the OP position. Although none of these differences is statistically significant, they provide further understanding of the tactical actions of the REALTRAIN and conventional units.

To be most effective, the maneuver element should be supported by a base of fire. The REALTRAIN and conventional squads differed with respect to the use of the M60 machinegun as a means of suppressing the OPFOR defenders during movement of the maneuver element (see Figure 16). During the pretest phase of the experiment, one REALTRAIN and one conventional squad used the M60 machinegun to provide a base of fire prior to or concurrent with initial attempts to maneuver against the OP. In the posttest, seven REALTRAIN squads and one conventional squad used the M60 to support the maneuver element in this manner. The posttest improvement by the REALTRAIN squads was significant ($p < .05$, χ^2).

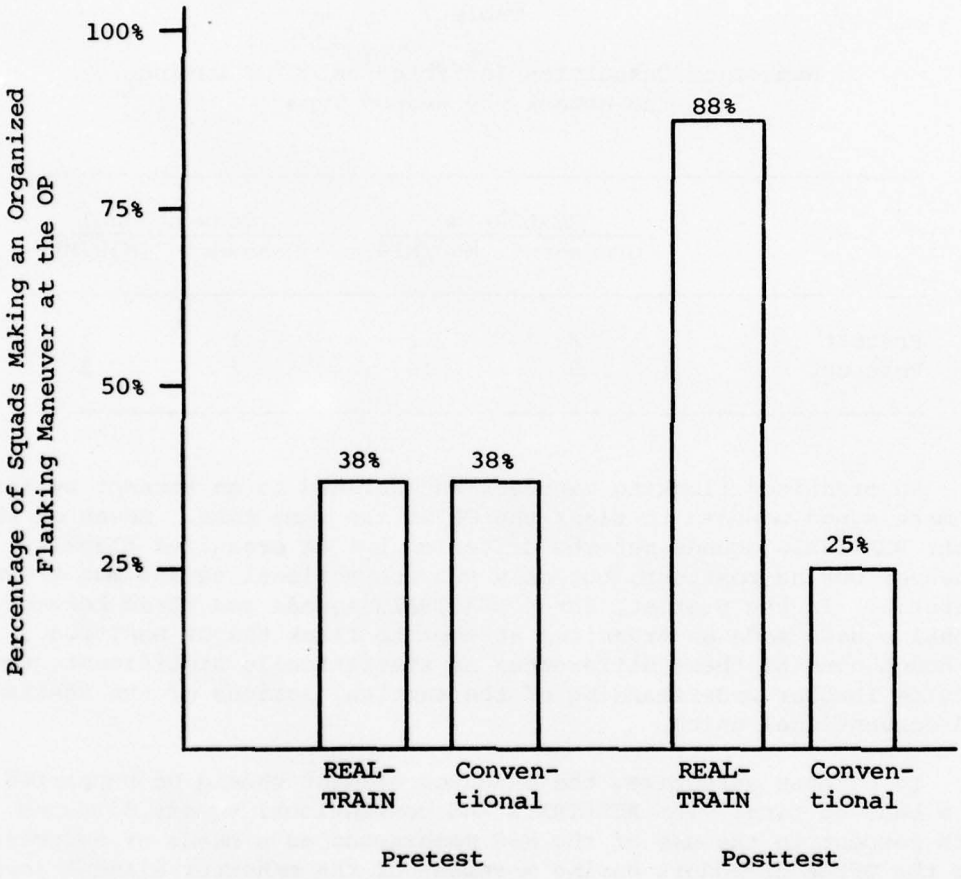


Figure 15. Organized flanking maneuvers at the OP.

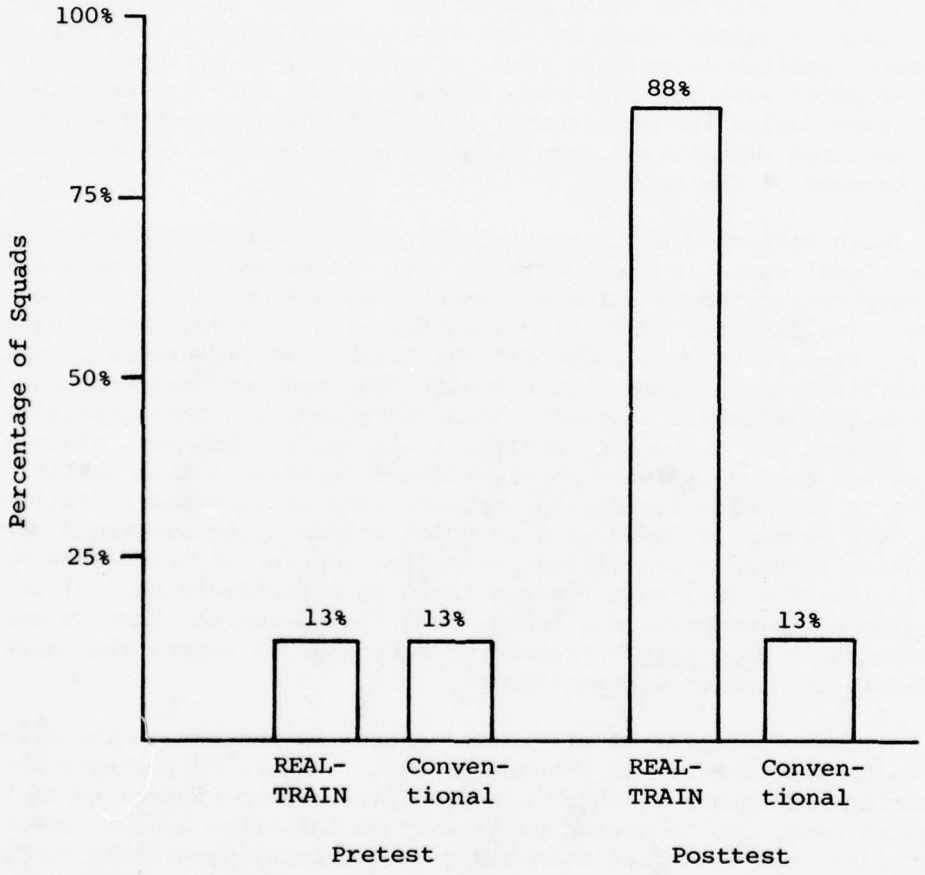


Figure 16. Percentage of squads using M60 to form base of fire concurrent with initial attempts to maneuver against the OP.

These data suggest that the REALTRAIN training led to an increased tactical sophistication in use of weapons systems in conjunction with movement. Controllers and data collectors also informally noted that the REALTRAIN units appeared to be more sensitive to weaknesses of the opposing forces, and that they more readily exploited these weaknesses.

3. Control and Coordination. Sound tactics and proper weapons system utilization undoubtedly contribute heavily to successful performance, and leader command and control constitute a critical element that helps to weld the squad into a team. Figure 17 presents the percentage of squads whose actions were controlled by a leader. To be scored positively on this item, a leader had to be in continual communication with the squad and take an active role in directing its activities during the engagement. Also, if the designated leaders were declared casualties, some other squad member was required to assume command of the unit.

These data show a substantial difference between REALTRAIN and conventional units in the posttest: All of the REALTRAIN squads were actively controlled by a leader compared to 38% of the conventional units. The data for conventional squads also show decreased leader control from pretest to posttest. Although this difference is not statistically significant, it suggests that conventional training may underemphasize leader control. These data indicate that generally most leaders did attempt to control their units. However, since at the outset most units were poorly trained in basic combat skills, attempts to control units during pretests were predisposed to failure. Also, the extremely rapid rate at which tested units sustained casualties (see Figures 5 and 6) made effective control of units even more difficult. Not only must leaders learn to effectively control units, but also squad members must learn to be responsive to commands and to execute these as a team. Fragmented responses to orders are unlikely to result in mission accomplishment.

Another indicator of effective control is whether in the attack the units performed as an integrated unit. Figure 18 presents the percentage of squads in which the lead fire team performed as an integrated unit. To be scored positively on this item by the senior controller, the lead fire team had to be internally mutually supportive. For example, if some of the fire team members moved forward toward the OP, other members of the team were required to support them by fire or use smoke grenades to conceal their advance.

Internal fire-team communication was also used in evaluating the squads on this item. These data show a large increase for REALTRAIN units from pretest to posttest and a slight, not significant, decrease for conventionally trained units. The results also suggest that although in most cases in the pretest leaders attempted to control their units (Figure 17), these attempts did not result in

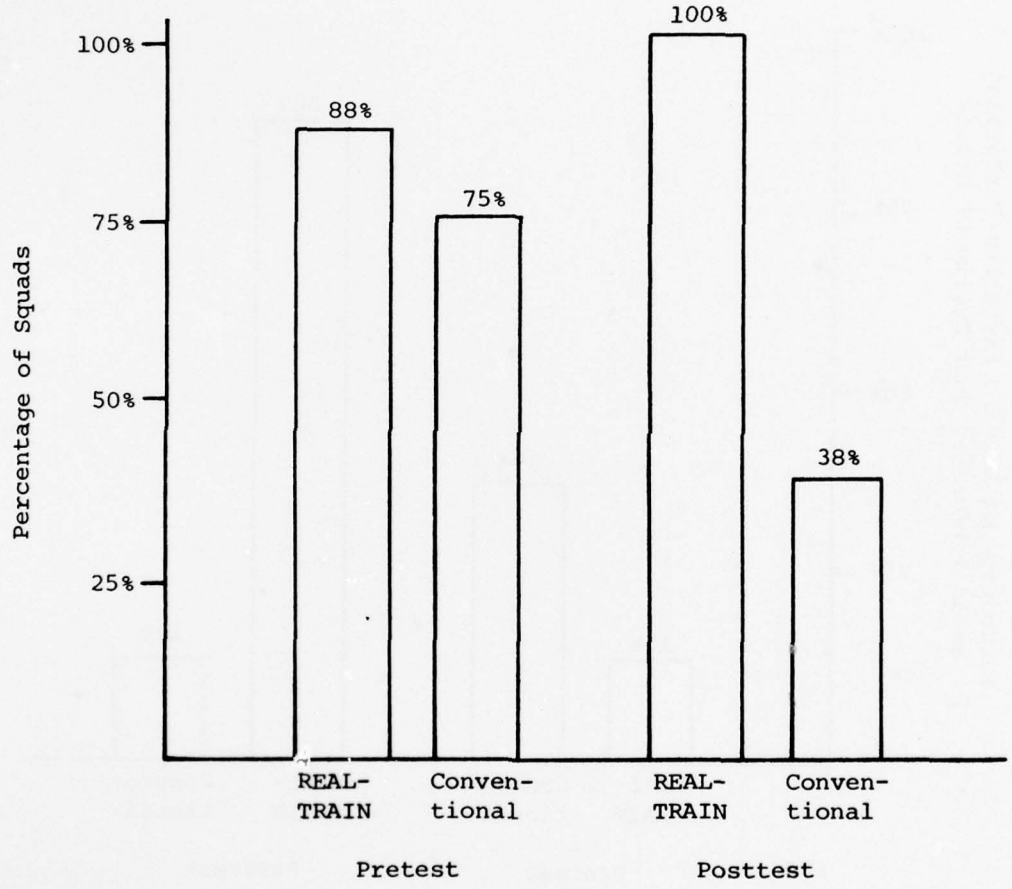


Figure 17. Percentage of squads whose attack was controlled by a leader.

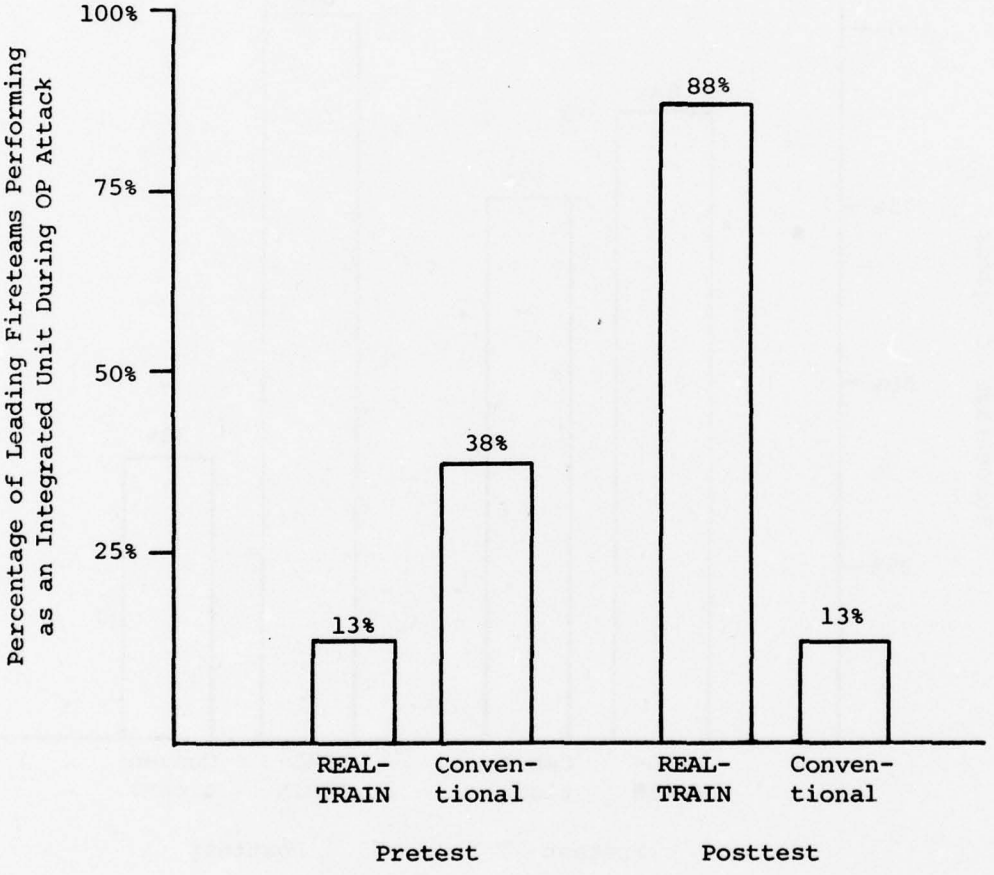


Figure 18. Leading fire teams performing as an integrated unit.

fire teams performing as integrated units. During posttests, however, REALTRAIN unit leaders were more effective in controlling their units so that they performed as a team.

The trailing fire teams could not be evaluated on a parallel item because often the squad leader elected to keep an RTO and the M60 machinegun team under his direct control. This left the trailing fire team leader and a single rifleman in what had been defined as the "trailing element."

Summary of the Attack. The preceding sections have described the performance of tested units in terms of a number of measures of tactical performance. Yet none of these alone is likely to lead to mission accomplishment or a favorable casualty exchange ratio. Weapons system employment, tactics, and command and control all play key roles in sound unit tactical performance. It is therefore reasonable to expect that the REALTRAIN squads, who were superior to conventional squads on terminal product measures, would be scored positively on more process-type performance measures than would conventionally trained squads. Table 8 presents the pooled data from the seven performance measures discussed above. The left column of the table indicates the number of measures on which squads were scored positively. The center and right columns indicate the number of REALTRAIN and conventional squads that were scored positively on a given number of performances. The performances included in the pooled data were (a) "stalled" in place, (b) used overwatch, (c) used suppressive fire, (d) used M60 machinegun, (e) employed an organized flanking maneuver, (f) leader-controlled squad, and (g) performed as an integrated unit.

As Table 8 shows, in the posttest, all REALTRAIN squads were scored positively on at least five of the seven performances, with 75% being scored positively on at least six. In contrast, conventional squads were scored positively on at most four of the seven measures, with 88% of conventional squads being scored positively on two measures or fewer. The test data clearly indicate that REALTRAIN squads not only performed better than conventional squads on individual tactical performance measures but also performed well consistently across a variety of measures.

Units were compared with respect to the number of squad actions performed as a function of training group and test. The interaction between training group and test was significant ($p < 0.001$; ANOVA mixed design). The effect of training on performance was significant for REALTRAIN units ($p < 0.05$; Tukey's HSD Test) but not for conventional units. The posttest differences between training groups were significant ($p < 0.05$; Tukey's HSD Test), while the pretest differences were not significant.

Table 8

Number of Tested Units Which Had Positive Scores on "n" Performance Measures, Where "n" Is the Number in the Left-Most Column--Performance Measures Are Identified in the Text

Number measures with positive scores	Number of units			
	Pretest		Posttest	
	REALTRAIN	Conventional	REALTRAIN	Conventional
0	0	1	0	2
1	1	1	0	3
2	4	2	0	2
3	1	2	0	0
4	0	0	0	1
5	1	0	2	0
6	1	0	4	0
7	0	0	2	0

As pooled measures of performance at the OP are drawn from a broad range of squad activities, they should be stable indicators of overall performance and should also be closely related to the terminal product measures, i.e., casualties sustained and inflicted. To determine the degree of relationship between these two measures, a casualty exchange index (CEI) was calculated and was correlated with the pooled measures. The CEI is equal to the number of casualties inflicted minus the casualties sustained by the tested units during the attack. The product-moment correlation coefficient between the CEI and the pooled measures was 0.60 ($p < .02$) for pretraining and posttraining tests, indicating a close correspondence between product and process measures. Thus, their pooled performance measures can be stable indicators of squad tactical performance.

The data presented in this section indicate that the performance of REALTRAIN squads was superior in terms of both product and process measures to that of conventionally trained squads. Controllers were asked to rate the tested squads' overall tactical performance following each attack. These ratings (see Figure 19) show that REALTRAIN squads were rated substantially higher than conventional squads during the posttest ($p < 0.05$; Tukey's HSD Test), but training groups did not differ during the pretest.

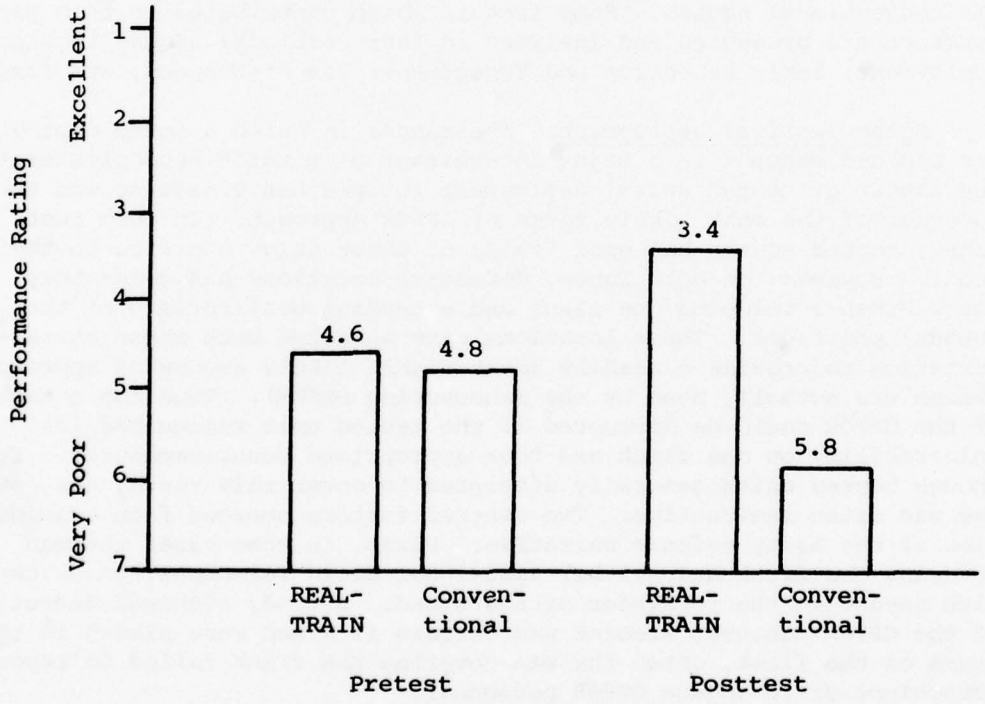


Figure 19. Ratings of overall tactical performance of tested units in the attack made by infantry officers.

The data presented here are fully consistent. As had been previously shown, following training, REALTRAIN units accomplished more missions while sustaining fewer and inflicting more casualties than conventional units. Moreover, REALTRAIN units showed substantial improvement on a variety of performance measures as well as on performance ratings by Infantry officers.

Section 3: Hasty Defense

The second mission in the tactical test was a hasty defense. Each squad leader was given a fragmentary order and shown a position that his squad was to occupy as part of a platoon defense. After the squad had had 15 minutes to prepare the defense, the OPFOR launched its attack, using a standardized tactical plan. As reported previously, after training, REALTRAIN squads conducted more successful defenses while sustaining fewer casualties and inflicting more casualties than did conventional squads. Some factors which contributed to this performance are presented and analyzed in four sections: Squad Tactical Deployment; Early Detection and Engagement; Use of Weapons; and Summary.

Squad Tactical Deployment. The manner in which a squad deploys its men and weapons is a major determinant of mission accomplishment. One aspect of tested units' deployment for the hasty defense was their coverage of the most likely route of OPFOR approach. On both test lanes, tested squads had good fields of observation and fire to their front. However, on both lanes, defensive locations had moderately thick brush enveloping one flank and extending well forward of the squads' positions. These locations were selected with those characteristics to provide a readily identifiable likely avenue of approach (which was actually used by the maneuvering OPFOR). Thus the attack of the OPFOR could be disrupted if the tested unit recognized its vulnerability on one flank and took appropriate countermeasures. Even though tested units generally attempted to cover this route, the coverage was often ineffective. Two central factors emerged from examination of the hasty defense narrative. First, in some cases the man covering the flank had neither visual nor field telephone communication with anyone in the remainder of the squad. Second, although detection of the OPFOR maneuver element was certain if a man were placed in the brush on the flank, often the man covering the flank failed to report detections or to engage OPFOR personnel.

Figure 20 presents the percentage of squads which had good coverage of the vulnerable flank. "Good coverage" was defined as (a) a man positioned to cover the vulnerable flank, with visual or field telephone communication with the rest of the squad; and (b) report of a detection prior to engagement. In the posttest, 75% of the REALTRAIN units had good coverage of the likely avenue of approach, compared with 38% of the conventional squads. Thus, following training, REALTRAIN units provided good flank security more often than did conventionally trained units.

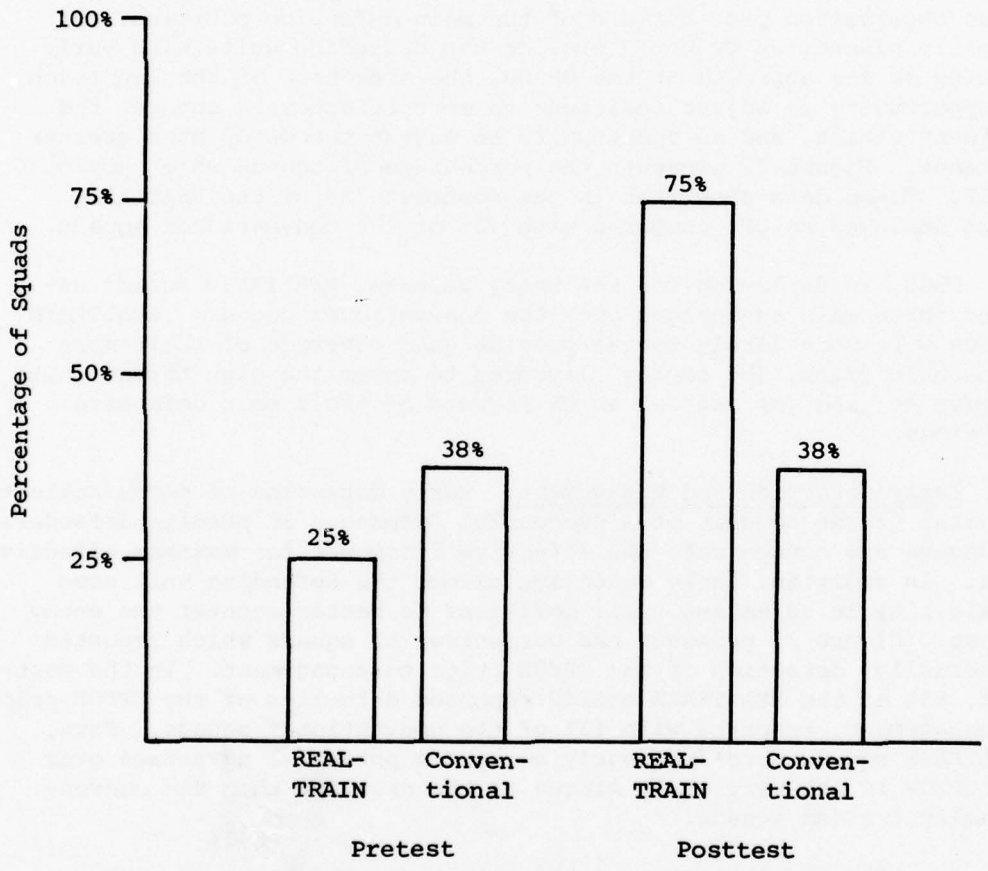


Figure 20. Percentage of squads with good coverage of vulnerable flank in the hasty defense.

An additional method for covering a likely avenue of approach is to employ claymore mines. While all the tested units employed their claymores, these were often poorly placed and did not cover the high-threat route of approach to the defensive positions. Figure 21 presents the percentage of claymores that were placed in the high-threat (and the actual OPFOR) route of advance. In the posttest, REALTRAIN squads placed 69% of their claymores in this area, compared with 44% for conventional squads. Thus, REALTRAIN squads brought more firepower to bear on critical terrain than did conventional squads.

Yet another aspect of the tested units' deployment was their use of an observation post forward of the main defensive position. If properly placed, an OP could provide the defending units with early warning of the approach of the OPFOR, the direction of that approach, an opportunity to adjust positions to more effectively counter the imminent attack, and an opportunity to engage the OPFOR at a greater distance. Figure 22 presents the percentage of squads which employed an OP. These data show that in the posttest 75% of the REALTRAIN units employed an OP, compared with 50% of the conventional squads.

Thus, in deploying for the hasty defense, REALTRAIN squads secured three main advantages over the conventional squads: REALTRAIN squads were more likely to (a) provide good coverage of their more vulnerable flank, (b) employ claymores to cover the high-threat route of advance, and (c) set out an OP forward of their main defensive positions.

Early Detection and Engagement. Early detection of enemy activity is vital to the conduct of a successful defense. It permits defenders to engage and concentrate the defensive firepower for maximum effectiveness. In addition, early detection allows the defending unit some flexibility in adjusting their positions to better counter the enemy thrust. Figure 23 presents the percentage of squads which reported (internally) detection of the OPFOR prior to engagement. In the posttest, 63% of the REALTRAIN squads reported detection of the OPFOR prior to engagement, compared with 13% of the conventional squads. Thus, REALTRAIN squads more frequently secured a potential advantage over the OPFOR in the very early stages of the exercise than did conventionally trained squads.

In order to capitalize on the potential advantages of early detection, the tested units should also begin to deliver fire on the OPFOR early in the exercise. Figure 24 presents the percentage of tested squads which opened fire before the OPFOR. These data indicate that in the posttest, 100% of the REALTRAIN squads and 25% of the conventional units opened fire before the OPFOR. Thus the REALTRAIN squads, to a greater extent than conventional squads, tended to gain tactical advantages in the early moments of the exercise by early detection of and delivery of fire on the OPFOR.

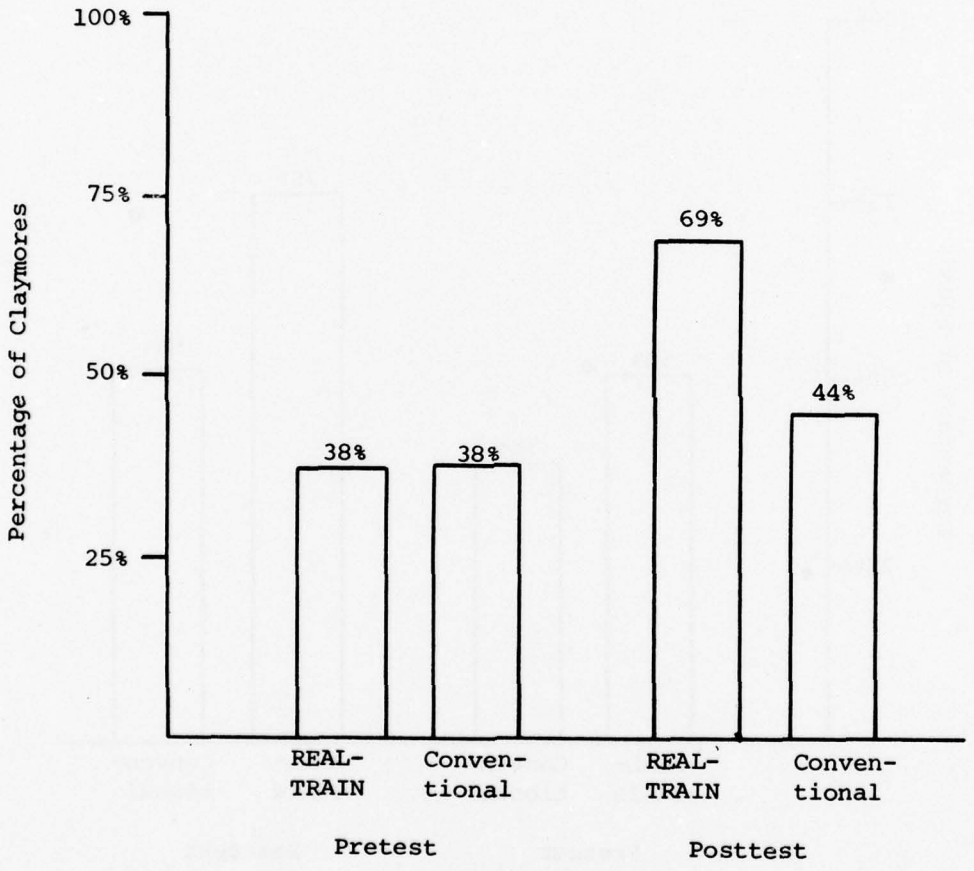


Figure 21. Percentage of claymores placed to cover tested units' vulnerable flank.

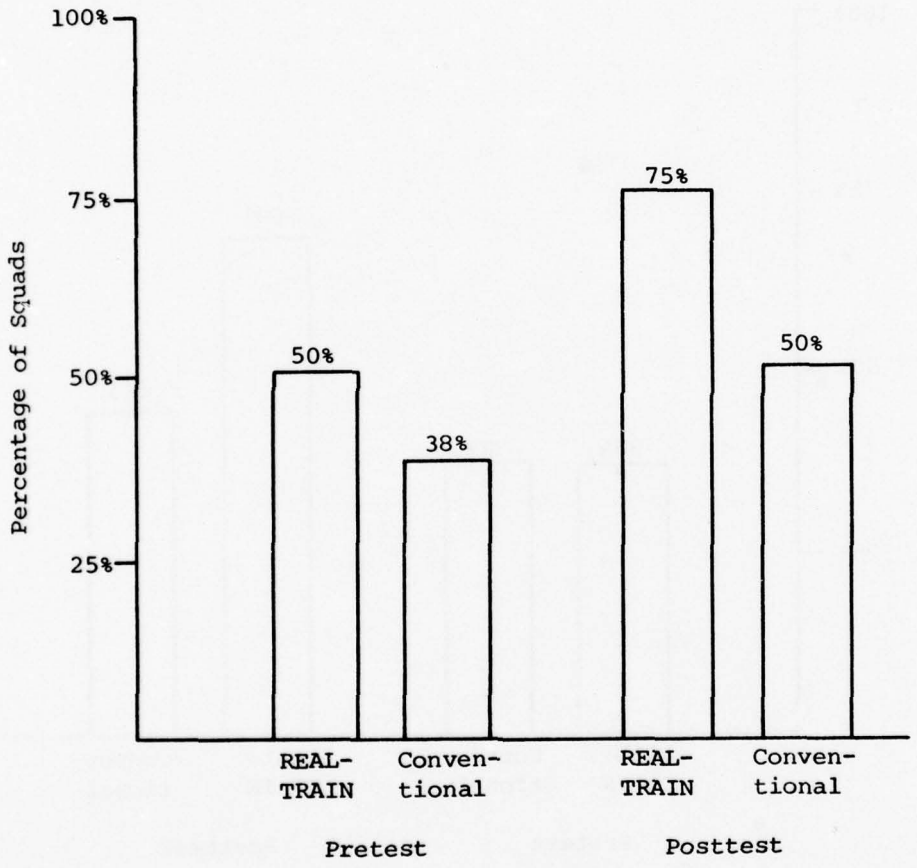


Figure 22. Percentage of squads which employed an OP in the hasty defense.

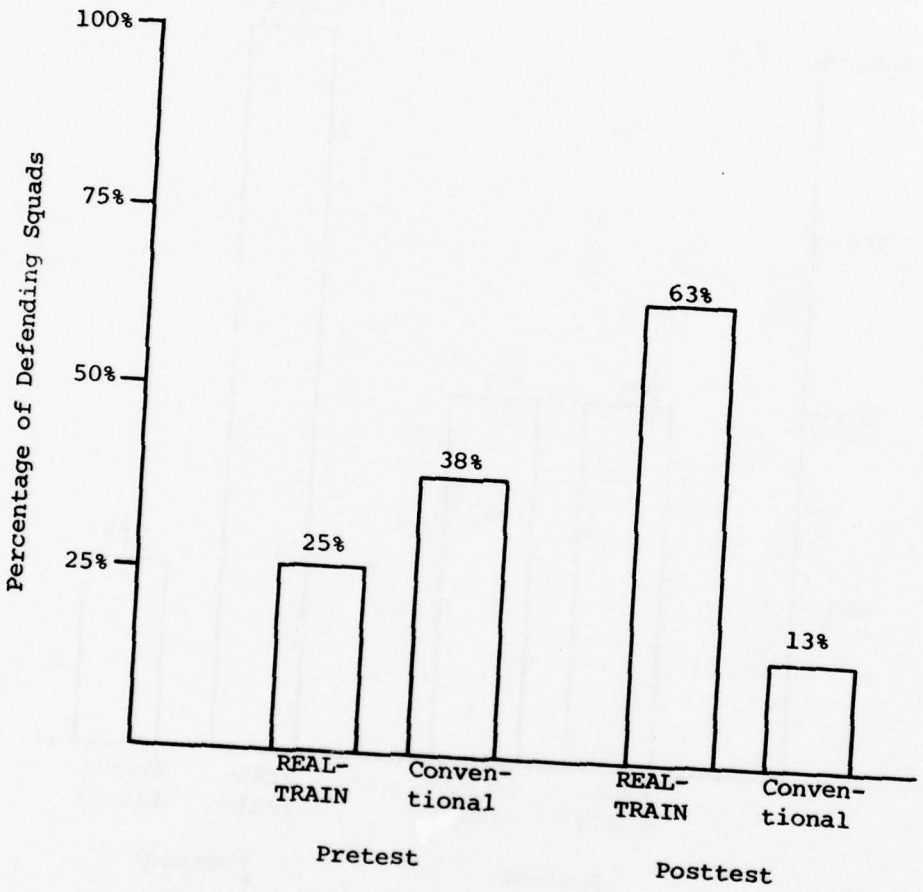


Figure 23. Percentage of squads detecting OPFOR prior to engagement in the hasty defense.

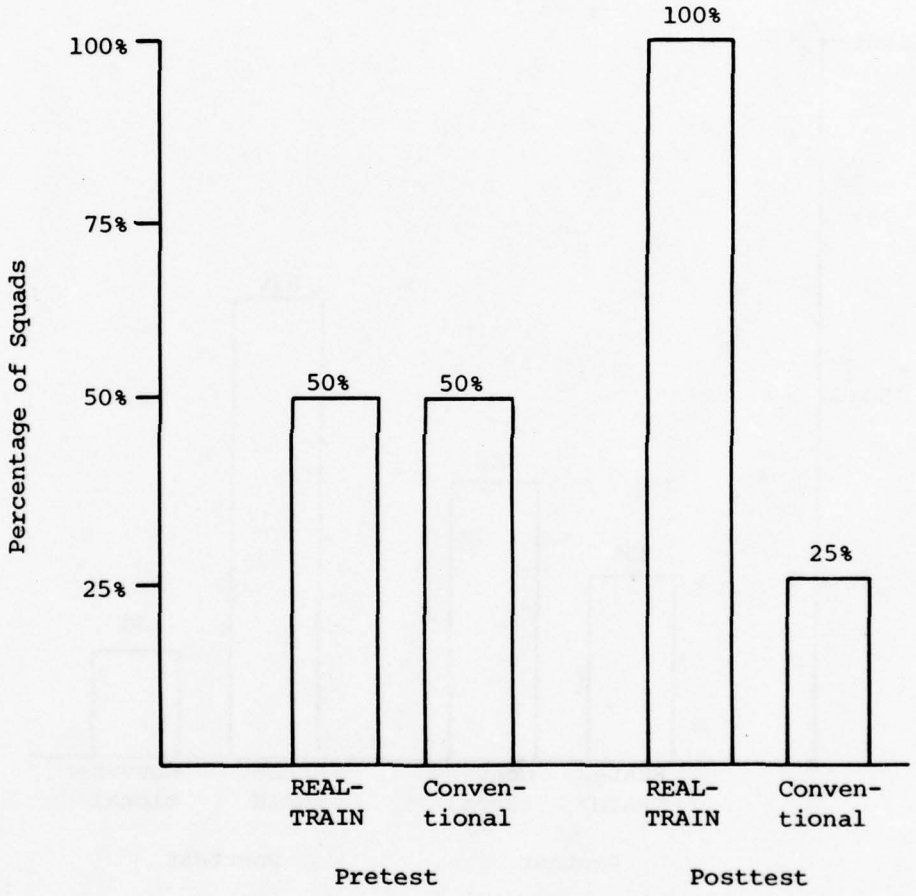


Figure 24. Percentage of squads firing first in the hasty defense.

Use of Weapons. During the hasty defense, tested units had four types of weapons available: M16 rifles, M60 machineguns, hand-grenades, and claymore mines. This section analyzes the use of weapons by the two training groups.

Table 9 shows the percentage of total casualties inflicted by each weapon type on the OPFOR. Despite the large increase in total casualties inflicted by the REALTRAIN group in the posttest (see Table 5), the proportion of casualties caused by each type of weapon did not differ for the two groups and did not change significantly from pretest to posttest.

Surprisingly few casualties were inflicted with the claymore mine, an important and lethal infantry weapon (although its effectiveness is highly dependent on its emplacement, aiming, and timing of detonation). Since REALTRAIN squads were more likely to use claymores to cover the OPFOR route of advance than were conventional squads, it seems that these squads, at least, should have inflicted more casualties than they did. The narrative data were therefore interrogated to determine why, even after training, the tested units did not employ the claymores more effectively. The data, presented in Figure 25, show that, during the posttraining tests, only 50% of the REALTRAIN squads and 13% of the conventional squads emplaced, aimed, and fired the claymore mines properly. The remaining squads all made mistakes of various kinds. For all the four REALTRAIN squads which committed errors, the claymores were properly set up but fired prematurely, i.e., before OPFOR personnel entered the casualty fan. For the seven conventionally trained squads that committed errors, in one case the claymores were properly set up but fired prematurely; in two cases they were properly set up but never fired; and in four cases errors were made in the emplacement or aiming of the claymores which made them ineffective. Thus, while REALTRAIN units which committed errors did so by poorly timed firing, conventional units tended more to make errors in emplacement and setup.

Summary of the Hasty Defense. The data in this section indicate that REALTRAIN squads performed better than conventional squads in three respects. First, REALTRAIN squads tended to deploy their men and weapons to minimize their vulnerability more frequently than did conventional squads. This was done by employing an OP forward of the main defensive position, by placing men and weapons to cover their more vulnerable flank, and by placing claymore mines to cover the most likely route of enemy advance. Second, REALTRAIN squads tended to detect and engage the OPFOR early more often than did conventional squads. Third, REALTRAIN squads tended to make fewer, less basic errors in the employment of claymore mines during the course of the engagement.

Table 9

Percentage of Total Casualties Inflicted by Each Weapon Type on OPFOR in the Hasty Defense

	Weapon Type					
	M16 or M60		Grenades		Claymores	
Test phase	REALTRAIN	Conventional	REALTRAIN	Conventional	REALTRAIN	Conventional
Pretest	57	65	40	26	3	9
Posttest	65	66	29	31	6	3

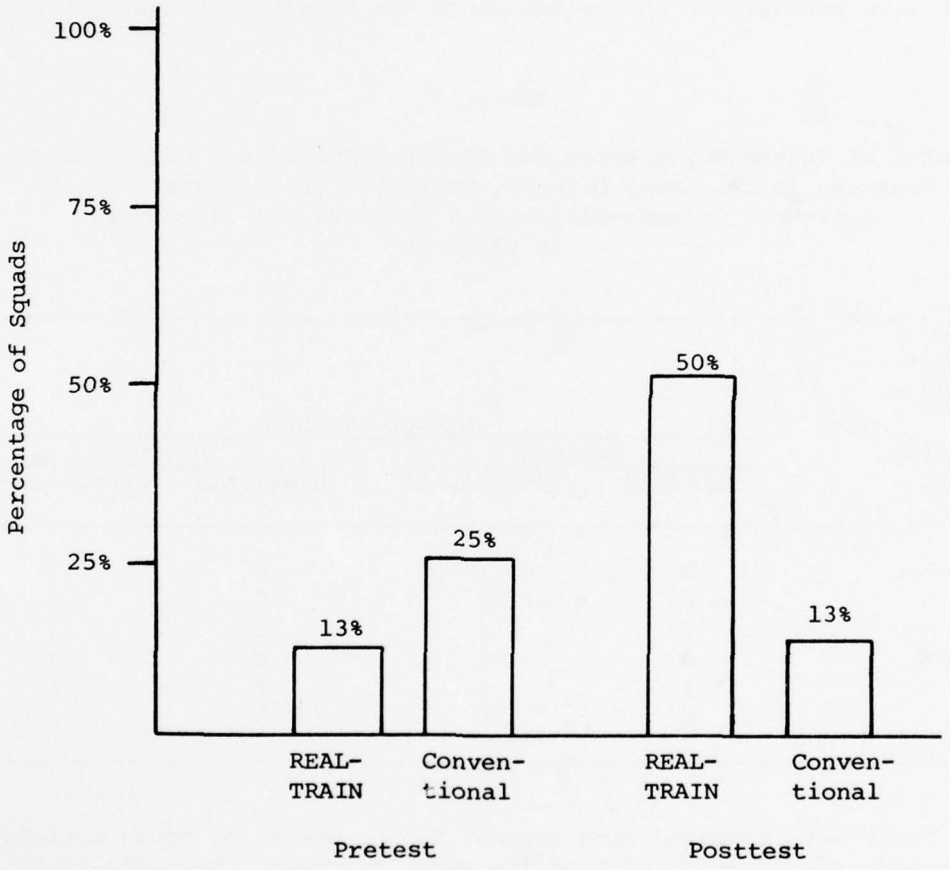


Figure 25. Percentage of squads whose claymore mines were well placed, well aimed, and fired during the engagement.

As was done for the attack, the principal measures discussed in this section were pooled and presented in Table 10. The measures included were (a) effectively covered vulnerable flank, (b) used an OP, (c) properly aimed, placed, and fired claymore, (d) detected OPFOR early, and (e) opened fire first. Table 10 shows that in the posttest, 75% of the REALTRAIN squads were scored positively on at least four of the five items, and 63% were scored positively on all five. In contrast, 88% of the conventional squads were scored positively on two or fewer of the five measures, and 63% were scored positively on only one single item. Thus, these process measures are fully consistent with the product data (casualties and mission accomplishment) which were reviewed in the beginning of the Results section.

Table 10

Number of Tested Units Which Had Positive Scores on "n" Performance Measures in the Hasty Defense, Where "n" Is the Number in the Left-Most Column--Performance Measures Are Identified in the Text

Number measures with positive scores	Number of Units			
	Pretest		Posttest	
	REALTRAIN	Conventional	REALTRAIN	Conventional
0	2	1	0	0
1	2	1	0	5
2	3	3	2	2
3	0	3	0	1
4	1	0	1	0
5	0	0	5	0

Units were compared with respect to the number of squad actions performed as a function of training group and test. The effect of training on performance was significant for REALTRAIN units ($p < 0.05$; Tukey's HSD Test) but not for conventional units. The posttest differences between training groups were significant ($p < 0.05$; Tukey's HSD Test), but the pretest differences were not significant.

The pooled measures were correlated with the CEI (see Attack Summary for fuller explanation) to determine the degree of relationship between these pooled measures and the casualty data. The product-moment correlation coefficient was equal to 0.63 ($p < .01$), indicating

a substantial relation between the pooled measures and the casualties inflicted and sustained during the hasty defense.

Section 4: Summary

Overall Tactical Performance. The preceding sections have analyzed the tactical performance of REALTRAIN and conventional squads in the attack and in the defense. The casualty and mission accomplishment data (presented in Banks et al., 1977, and reviewed in the beginning of the Results section) are clearly consistent with and supportive of the results which have been presented here. REALTRAIN units demonstrated a dramatic improvement across a variety of performance measures following only 3 days of tactical training. Conventionally trained units, however, showed no substantial improvement after the 3-day training period.

The previous sections presented data from the attack and defense separately. By way of summary, Table 11 shows data from the pooled measures (presented separately in the Attack and Defense Sections) for both types of exercise. The performances measured during the attack consisted of (a) "stalled" in place, (b) used overwatch, (c) used suppressive fire, (d) used M60 machinegun, (e) employed flanking maneuver, (f) leader controlled the squad, and (g) performed as an integrated unit. Defense measures consisted of (a) effectively covered vulnerable flank; (b) used OP; (c) properly aimed, placed, and fired claymore; (d) detected OPFOR early; and (e) opened fire before the OPFOR. The data show that the differences between groups are strong and unequivocal. Seventy-five percent of the REALTRAIN squads were scored positively on at least 10 of the 12 measures, and 50% were scored positively on at least 11. Conventionally trained squads, on the other hand, were scored positively on at most 5 of the 12 measures, and 63% were scored positively on 3 or fewer of the items. The training effect for the REALTRAIN squads and the posttest difference between REALTRAIN and conventional squads were both significant at the $p < .05$ level (Tukey's HSD Test). Other differences were not statistically significant. Moreover, the pooled measures showed a close relation to the casualty exchange index, with a product-moment correlation of 0.72 ($p < .01$, $df = 14$).

Implications. Current rifle squad ARTEPs focus the evaluation process most heavily on movement to contact and on terminal products. They do not provide substantial guidance to trainers on critical squad performances during engagements themselves. Incorporation of new measures of engagement-related tactical performances is essential for the improvement of performance-oriented training and evaluation. Product-oriented measures, such as casualties, are affected by a large number of factors in addition to the training status of a unit. These factors include mission and situation, weather, terrain, relative combat power, skill of the opposition force, and chance events.

Consequently, such measures of performance are not, by themselves, reliable or valid indexes of the capabilities of a unit. (Given sufficient standardized replications, they can be useful for determining average tactical proficiency of a number of units.) Terminal product measures must be supplemented by measures of critical tactical processes in order to permit more adequate evaluation, accurate diagnosis of training deficiencies, and efficient conduct of remedial training. Some of these critical tactical processes for rifle squads, and possible measurement procedures, are identified by the analyses presented in this report. Others will be identified in subsequent reports. Moreover, the implications of this research for the training of larger units (e.g., platoon and company) are also significant, as most of the processes investigated are essential ingredients of sound tactical performance (e.g., overwatch, suppression) by these units as well. Thus, the data and analyses presented here not only indicate the substantial training benefits to be derived from employment of REALTRAIN, but also, and perhaps more importantly, constitute a major step toward development of improved ARTEPs.

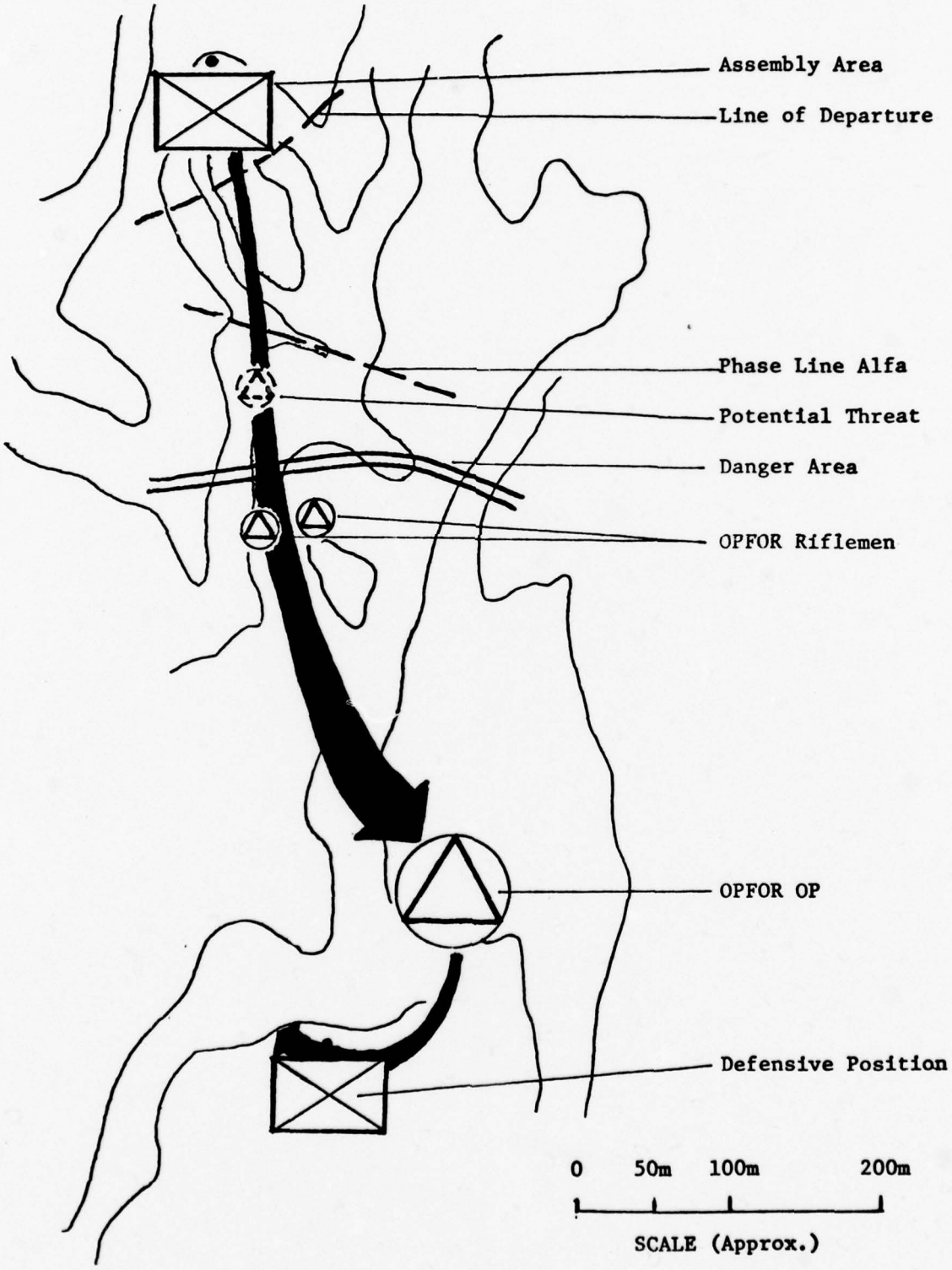
Table 11

Number of Tested Units Which Had Positive Scores on "n" Performance Measures in the Hasty Defense and in the Attack on the OP, Where "n" Is the Number in the Left-Most Column--Performance Measures Are Identified in the Text

Number measures with positive scores	Number of Units			
	Pretest		Posttest	
	REALTRAIN	Conventional	REALTRAIN	Conventional
0	0	0	0	0
1	1	0	0	1
2	1	1	0	3
3	1	2	0	1
4	2	1	0	2
5	1	2	0	1
6	0	1	0	0
7	1	1	1	0
8	1	0	1	0
9	0	0	0	0
10	0	0	2	0
11	0	0	2	0
12	0	0	2	0

APPENDIX A

SKETCH MAP FOR LANE 2 SHOWING LOCATIONS OF KEY SCENARIO EVENTS



APPENDIX B

ATTACK ORDER AND MAP GIVEN TO SQUAD LEADERS IN ASSEMBLY AREA
(WITH FRAG ORDER FOR HASTY DEFENSE)

(BOTH LANES)

AT DISMOUNT POINT

To Squad Leader: Your squad is to remain at this location. Follow me to your first position.

AT ASSEMBLY AREA SITE:

Your squad is to occupy part of a platoon assembly area perimeter. Your sector is from _____ to _____ (Designate on the ground).

Enemy stragglers have been seen in the area so, your reconnaissance and subsequent occupation should be conducted tactically. Any activity should be reported to me.

You are to conduct a hasty reconnaissance and select initial positions. When you are ready to move your squad into position, report to me.

Any Questions?

Note: Return squad leader to his squad. Form in squad column and move 1/2 the distance to assembly area. At that point turn control over to squad leader and instruct him to "Occupy your assembly area." You have 15 minutes to set up your defensive perimeter.

(LANE 1)

SQUAD ORDER - MOVEMENT

SITUATION

ENEMY: Combat action of the division over the last 3 days has left the enemy confused and disorganized. Pockets of resistance and stragglers are being discovered all over the division area.

FRIENDLY: The division has been ordered to move forward to establish contact with the enemy main force. Pockets of resistance are to be eliminated. The battalion has been ordered to move to the east to secure high ground above the Salinas valley and await further orders.

MISSION

A. Map Orientation. Squad Location.

B. The platoon, as the point element of the company, moves along the ridge line to initially secure Hill 370 and await further orders.

Squad #1 - Point Squad - moves along ridge line to Hill 370. Move as quickly as possible, but conduct a thorough reconnaissance along route. Be watchful for enemy stragglers, report all intelligence items found and signs of recent enemy presence.

Second and third squad leaders have already been briefed.

Squad #2 - Follow Squad #1 - protect platoon left flank.

Squad #3 - Follow Squad #1 - on line with the 2D Squad, protect platoon right flank.

SERVICE SUPPORT

1. Ammunition will be brought forward after any significant contact.

2. Casualties are to remain in place until released by a controller.

COMMAND AND SIGNAL

1. Make a communications check prior to leaving the assembly area.

2. Cross the line of departure (Indicate on map) at _____ hours.

3. Report crossing the line of departure, phase line alpha (Indicate) and arrival at Hill 370.

4. Report all significant events. Enemy information is essential.

5. I will trail your squad.

6. The platoon sergeant will accompany the 3D Squad on the right flank.

7. The company command element will trail this platoon.

8. Your call sign will be _____: Frequency is _____.

9. The time is now _____. Do you have any questions?

(LANE #1)

MISSION

Our location is here (Point out). We will move along the ridge line to our Objective, Hill 370. (Point out arrow and Objective). Our Objective is approximately 1000 meters from our location. Our LD is located approximately 50 meters east of the AA; the road runs perpendicular to the ridge. Report LD to me when you cross it. Phase Line Alpha is located here. It is also a road running perpendicular to the ridge. Report Phase Line A when you cross it. Intelligence reports a minefield here (Point out). Stay clear of mine field. If you stay along the ridge line you should have no problems with it.

(LANE 1 & LANE 2)

HASTY DEFENSE

SITUATION

ENEMY. Company commander has told the platoon to hold in place. There is moderate enemy activity across the whole Bn front. He's waiting for orders from Battalion.

FRIENDLY. Situation is unsure - Information fragmented - we're to be prepared for anything.

MISSION

Platoon is to go into hasty defense on this hill - Immediately - I'll designate squad positions on the ground. We are to wait for further instructions.

EXECUTION

1. Position will be a triangle - make sure flanks are tied in tight.

2. Use maximum camouflage and available cover - get into position quickly. We'll improve the positions later if we stay.

SERVICE SUPPORT

1. Ammunition resupply has been completed - call for more if required.

2. Casualties will remain in position until released by a controller.

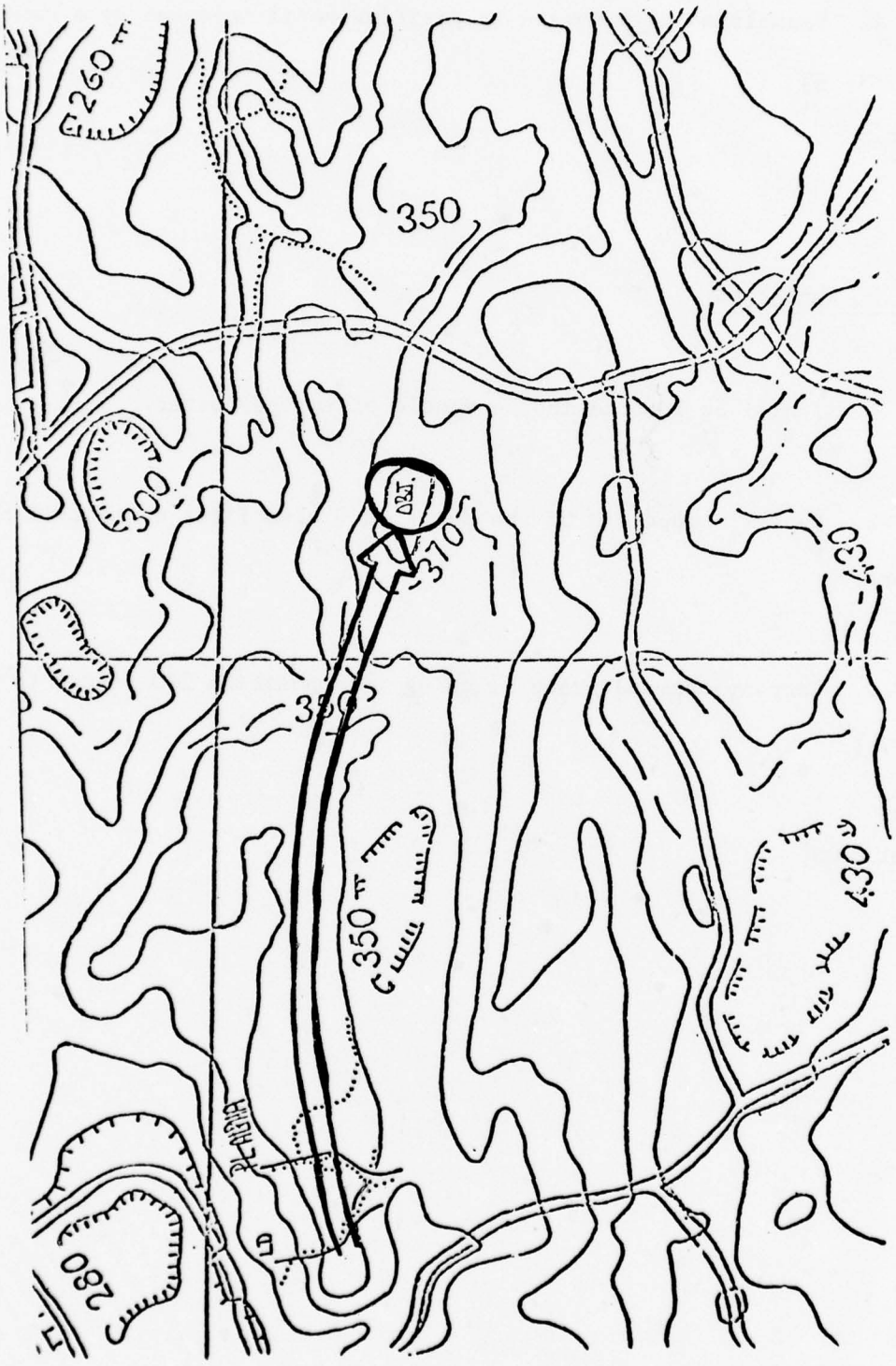
COMMAND AND SIGNAL

1. I will be located in the middle of the perimeter.

2. Report occupation of the position - also first contact if any occurs.

3. Company command group is going into position 200 meters to the rear.

Questions?


260
350
300
370
350
350
280
130

(BOTH LANES)

AT DISMOUNT POINT

To Squad Leader: Your squad is to remain at this location. Follow me to your first position.

AT ASSEMBLY AREA SITE:

Your squad is to occupy part of a platoon assembly area perimeter. Your sector is from _____ to _____ (Designate on the ground).

Enemy stragglers have been seen in the area so, your reconnaissance and subsequent occupation should be conducted tactically. Any activity should be reported to me.

You are to conduct a hasty reconnaissance and select initial positions. When you are ready to move your squad into position, report to me.

Any Questions?

Note: Return squad leader to his squad. Form in squad column and move 1/2 the distance to assembly area. At that point turn control over to squad leader and instruct him to "Occupy your assembly area." You have 15 minutes to set up your defensive perimeter.

(LANE 2)

SQUAD ORDER - MOVEMENT

SITUATION

ENEMY: Combat action of the division over the last 3 days has left the enemy confused and disorganized. Pockets of resistance and stragglers are being discovered all over the division area.

FRIENDLY: The division has been ordered to move forward to establish contact with the enemy main force. Pockets of resistance are to be eliminated. Your battalion has been ordered to move to the west to secure high ground overlooking Monterey Bay and await further orders.

MISSION

A. Map Orientation. Squad Location.

B. The platoon, as the point element of the company, moves along the ridge line to initially secure the ridge at coordinates 115558 and await further orders.

Squad #1 - Point Squad - moves along ridge line to the Objective. Move as quickly as possible, but conduct a thorough reconnaissance along route. Be watchful for enemy stragglers, report all intelligence items found and signs of recent enemy presence.

Second and third squad leaders have already been briefed.

Squad #2 Follow Squad #1 - protect platoon left flank.

Squad #3 - Follow Squad #1 - on line with the 2D Squad, protect platoon right flank.

SERVICE SUPPORT

1. Ammunition will be brought forward after any significant contact.

2. Casualties are to remain in place until released by a controller.

COMMAND AND SIGNAL

1. Make a communications check prior to leaving the assembly area.

2. Cross the line of departure (Indicate on map) at _____ hours.

3. Report crossing the line of departure, Phase Line Alpha (Indicate) and arrival at Hill 370.

4. Report all significant events. Enemy information is essential.

5. I will trail your squad.

6. The platoon sergeant will accompany the 3D Squad on the right flank.

7. The company command element will trail this platoon.

8. Your call sign will be _____. Frequency is _____.

9. The time is now _____. Do you have any questions?

(LANE #2)

MISSION

Our location is here (Point out). We will move along the ridge line to our Objective. The ranger station (located at grid 113558)

(Point out arrow and Objective). Our Objective is approximately 1500 meters from our location. Our LD is here (Point out). It is a road located approximately 50 meters west of the AA; the road runs perpendicular to the ridge. Report LD to me when you cross it. Phase Line Alpha is located here (Point out). It is also a road running perpendicular to the ridge. Report Phase Line A when you cross it. Stay along the ridge line.

HASTY DEFENSE

SITUATION

ENEMY. Company commander has told the platoon to hold in place. There is moderate enemy activity across the whole Bn front. He's waiting for orders from Battalion.

FRIENDLY. Situation is unsure - Information fragmented - we're to be prepared for anything.

MISSION

Platoon is to go into hasty defense on this hill - Immediately - I'll designate squad positions on the ground. We are to wait for further instructions.

EXECUTION

1. Position will be a triangle - make sure flanks are tied in tight.

2. Use maximum camouflage and available cover - get into position quickly. We'll improve the positions later if we stay.

SERVICE SUPPORT

1. Ammunition resupply has been completed - call for more if required.

2. Casualties will remain in position until released by a controller.

COMMAND AND SIGNAL

1. I will be located in the middle of the perimeter.

2. Report occupation of the position - also first contact if any occurs.

3. Company command group is going into position 200 meters to the rear.

Questions?

260
PLAINS
350
300
370
430
350
350
430
260
OBS
2-15

APPENDIX C

INFANTRY SQUAD REALTRAIN VALIDATION

SCENARIO

Dramatis Personae

Controller No. 1	(C-1)	Senior Controller
Controller No. 2	(C-2)	Controller, Platoon Leader
Controller No. 3	(C-3)	Controller of OPPFOR
Controller No. 4	(C-4)	Controller of OPPFOR
Data Collector No. 1	(DC-1)	Mobil Data Collector (ARI)
Data Collector No. 2	(DC-2)	Infiltrator
Data Collector No. 3	(DC-3)	Danger Area OPPFOR
Map Maker	(MM)	Mobil Map Maker
Platoon Leader RTO	(RTO)	Tactical Net Monitor at ECC
REALTRAIN Control Net Operator	(NCS)	Net Control Station Operator at ECC

SCENARIO

Assembly Area

a. The Ops NCO will move the squad from the ECC to the lane report point. When the Ops NCO leaves with the squad, the NCS operator will broadcast "Squad on the way" over the control net.

At this time DC-1 will alert DC-2 that the squad has left the ECC. At this time Data Collector 1 (DC-1) will call DC-2 and inform him that the trial has begun (see d. below).

b. At the lane report point, the platoon leader picks up the squad leader and takes him to the assembly area. The remainder of the squad waits at the report point for test firing weapons under the direction of the Ops NCO. The platoon leader points out the right and left limits of the squad sector of the platoon perimeter. The platoon leader will then order the squad leader to bring his squad up and set up his sector of the platoon perimeter. The platoon leader will inform the NCS operator that the trial has begun. The platoon leader will tell the squad leader to be ready to receive his order in about 15 minutes.

c. The platoon leader will, after the allotted 15 minutes, take the squad leader to a predesignated spot some distance from the assembly area toward the LD, and deliver the order to the squad leader. As the platoon leader and squad leader depart the assembly area C-1 will determine whether the defensive perimeter has been set up. If so, C-1 will so inform NCS and DC-1 will call DC-2 (see d. below). If the perimeter set-up is still not completed, C-1 and DC-1 will wait until it is completed and then complete the above coordinations.

d. Upon being informed by DC-1 that the squad is moving into the assembly area (see a. above) a remote Data Collector (DC-2) will listen for breaches in squad noise discipline, but will not observe the assembly area perimeter. Upon receiving a second call from DC-1 indicating that the assembly area perimeter is set up (see c. above), DC-2 will locate himself in a predetermined position and observe the perimeter noting cases of poor or inadequate use of cover/concealment until instructed to begin his path. When the squad leader returns to deliver the squad order, DC-1 calls DC-2 to begin traversing a predesignated target path with numbered stakes. When a squad member reports detection of DC-2, DC-1 will call DC-2 and the latter will record the nearest stake number. If the infiltrator detection is not made by a squad member in the vicinity of DC-1, either C-1 or C-2 will inform DC-1 if a detection is made. When/if a squad member takes DC-2 under fire, DC-2 will record the nearest stake number when he hears the shot. In order to insure that this data is taken, DC-1 will attempt to determine whether the squad member(s) who fired had detected DC-2 and then will call DC-2 who, if he had not already recorded a "fire" stake number, will record the number of the last stake he passed

prior to the call. If DC-2 completes his target path without being detected he will enter the number of the last stake on his target path. Stakes will be set at 3 m intervals.

e. During the assembly area procedures, C-1, C-2, and MM will collect the data indicated on their data collection forms/maps.

f. At the conclusion of the platoon leader's briefing of the squad leader, the platoon leader will use the squad leader's radio to inform his "RTO," who is the tactical net monitor, that he has finished delivering his order. The "RTO" will enter the time of this communication in his log. The squad leader will then return to his squad, give his briefing, and begin preparations for departure from the assembly area so as to cross the line of departure at the appointed time (15 minutes from the completion of the platoon leader's order).

g. Following delivery of the order to the squad by the squad leader, preparations for departure of the assembly area will be made, and C-1 and C-2 will complete the subjective rating items on their respective data forms. As the first squad member leaves the defensive perimeter, C-2 will so inform NCS, and as the last man leaves, C-2 will again inform NCS.

h. After the squad has left the assembly area DC-2 moves to the area, checks for equipment left behind. Upon completion of his form (and after the tested squad has passed the danger area), DC-2 will move to the danger area and deliver his Data Collection Form to the danger area rifleman (DC-3). The latter will deliver this form to DC-1 at the hasty defense area upon conclusion of the exercise. DC-2 will pick up the potential threat map from DC-3 and return it to the potential threat when he returns to the assembly area to prepare the site for next squad.

Line of Departure (LD)

a. The squad leaves the assembly area and moves to the LD. As the point of the squad crosses, C-1 calls NCS and informs him. As per the platoon leader's order, the squad leader calls the platoon leader's RTO on crossing the LD and the latter records the time of the communication.

b. If the squad moves outside the test lane boundaries, DC-1 will instruct the squad leader to make the appropriate changes in direction and make a note on his form for inclusion in the narrative.

c. C-1, C-2, DC-1, and MM will record data indicated on their respective data forms.

Phase Line A

a. As the squad continues to move along its route of advance, it will approach and cross a phase line (Phase Line A). If the squad leader reports his location to the platoon leader RTO as required by the platoon leader's order, the time of that report will be logged by the RTO. C-1, C-2, DC-1, and MM will take data as indicated on their forms/maps.

b. As the squad leader crosses Phase Line A, C-2 will call NCS and the NCS will log the time of that communication.

Potential Threat

a. As the squad continues along its route of advance, it will approach an abandoned prepared position which contains a map pouch with a map of the local area and deployment of enemy units indicated. The location of these hypothetical units, however, is well away from the test lane.

b. Detection/reaction to the potential threat position will be noted as indicated on the appropriate data forms and map. Platoon leader's RTO will log the time of any report made by the squad.

c. If the squad leader or squad member sees and recognizes the intelligence value of the map, C-2 will interface, qua platoon leader, with the squad leader, and receive the map. The map and map pouch will be carried by C-2 to be handed off the DC-3 who will give it to DC-2 to replace in the abandoned position immediately after the squad departs the area.

d. Upon passing the potential threat, DC-1 will call DC-3 and inform him that the squad is approaching.

Danger Area

a. As the squad continues its movement along its route of advance, it will approach a highly dangerous area which it must cross. The remote Data Collectors (DC-3a, DC-3b) will gather data on the manner in which the squad approaches the area, as will C-1, C-2, DC-1, and MM. The platoon leader's RTO will log the time of any reports made by the squad.

b. C-1 will call NCS as the point reaches the edge of the danger area and the NCS will log the time of that communication.

c. C-2 will call NCS as the last man crosses the danger area and the NCS will log the time of that communication.

Contact With First OP

a. When the point man has crossed the danger area (point marked on course), the closest DC-3 will open fire on the squad followed immediately by the second DC-3. They will continue to fire 3 to 5 round bursts at approximately 10 to 15 second intervals for 2 minutes or until each is declared a casualty based on some squad action. If at the end of 2 minutes a DC-3 has not been assessed a casualty, he will retreat from his position along a designated path.

b. No squad casualties will be assessed. Only DC-3 may be assessed a casualty. When DC-3 helmet number is correctly identified the appropriate controller will call NCS. The appropriate controller will assess the casualty by voice communication. No controller will be co-located with DC-3. DC-3 will carry a walkie-talkie for communication with the ECC and with DC-1.

c. Upon being assessed a casualty, DC-3 will remove his helmet and sit or lie on the ground until the squad has passed by. Once the squad has completely passed the danger/contact area, DC-3 will effect whatever repairs are required to the practice claymores and police up the area in order to prepare for the next trial. Following contact, he will be joined by DC-2, will take DC-2's data form, and give DC-2 the map pouch for return to the potential threat (if necessary). At the end of the exercise he will join the other data collectors/ controllers at the hasty defense position for preparation of the exercise narrative.

d. All controllers and data collectors will collect the data indicated on their respective forms/maps.

Near Control Phase Line C

a. As the squad continues to move toward its objective, it will approach an enemy OP. The OPPFORs located at the OP will only open fire on the squad (1) if some squad member has crossed Phase Line C, or (2) if the squad opens fire on the OPPFORs before anyone crosses Phase Line C.

b. If the OPPFORs open fire first, according to the conditions specified in "a" above, they will open fire with several 3 to 5 round M16 bursts. The M60 will not open fire until several targets of opportunity are present at least 1 minute following the initiation of contact. C-3 will insure that OPPFORs follow the rules of initiation of contact.

c. Once contact has been initiated, the squad leader, as per the platoon leader's orders, is required to report the engagement to the platoon leader's RTO who will log the time of that communication.

d. If the squad fires for suppressive effect the OPPFORs will be suppressed by that fire. C-3 will insure that all OPPFORs are "down" during any delivery of a heavy volume/rate of fire. C-3 will call "suppress" each time, in his judgment, that the OPPFORs would have been suppressed by incoming fire. OPPFORs will remain "down" for approximately 3 seconds following each suppress call by C-3. Any OPPFOR not responding to a "suppress" call will be assessed a casualty. The same rules and procedures will apply to the tested squad and Controllers 1 and 2.

Attack on the OP

a. Following initiation of contact no direction or assistance (e.g., indirect fire support) will be available to the squad. Questions from the squad leader concerning tactics, options, etc. will be answered to the effect that the squad is to continue their mission and to take the objective. No guidance on how to accomplish the squad's mission will be offered by any test personnel. The engagement will continue either until all the squad members are declared casualties, or until the squad eliminates resistance, establishes initial security positions, and reorganizes. Should DC-1 judge that the engagement should be terminated before this time, he will inform C-1 or C-2 of his decision and the controller will call NCS and inform him that the attack has been terminated. In this case, NCS will insert that time in the space titled "Start Break." If the engagement proceeds to its conclusion, when the first man arrives at the OP, C-1 will call NCS and NCS will log the time of that communication. If the squad takes the OP, the remaining squad members will remain tactical and hold the security positions they have taken. Regardless of the outcome, squad members who are declared casualties will remain in place until released by the senior controller (C-1) who will be advised by DC-1 when all necessary data collection efforts have been carried out.

b. At the OP, if there is any doubt, C-1 or C-2 will remind the squad members that they are to remain tactical.

c. If the squad attempts reorganization, DC-1 will collect the data specified in Form #3 and inform C-1 when he has completed that task. If the squad does not attempt reorganization, DC-1 will allow 3 minutes to elapse and then inform C-1 that he has completed collecting data. At that time C-1 will call NCS and inform him that the attack on the OP has been terminated. The NCS will insert that time in the space titled "Start Break."

d. At the conclusion of the attack, MM, C-1, C-2, C-3, and DC-1 will complete their data forms as required. DC-1 is responsible for assuring that all data collection efforts are completed before commencement of the next phase of the scenario.

e. After the data collection has been completed, the OPPFORs will join the remaining OPPFORs in the ECC area under the control of the OPPFOR NCOIC.

Reconstitution of Squad

a. Following completion of the relevant data collection forms/ maps, the squad will be reconstituted.

b. At this time helmet numbers will be changed, the squad will be resupplied with hand grenades and ammo as necessary. The senior controller (C-1) will supervise these operations.

c. Also, the OPPFORs who had participated in the previous portion of the exercise will change helmet numbers in the administrative area. All helmet numbers will be checked against the NCS-OPPFOR roster. C-3 and the OPPFOR NCOIC will be responsible for insuring all OPPFORs have weapons, ammo and hand grenades, and the appropriate unobscured helmet numbers.

d. After reconstitution and resupply, the squad will be given a frag order by the platoon leader and move tactically to the site of their hasty defensive position.

Preparation of the Hasty Defense

a. As the squad enters the hasty defense site C-1 will call NCS and inform him. The NCS will log the time of this communication opposite the log entry entitled "end break." NCS will, at this time, call C-3/C-4 and inform them of the squad's arrival at the hasty defense site. C-3/C-4 will allow 15 minutes to elapse and then begin to move along their predesignated routes to hasty defensive site.

b. At the hasty defense site, the squad will set up a squad section of a platoon perimeter. The squad will be given about 15 minutes from entry into the defensive site until the OPPFORs begin to move against the position. OPPFORs begin to move against the position. OPPFORs will move along predesignated routes of advance but will have some individual latitude in the use of cover/concealment, specific routes, etc.

Conduct of the Defense

a. Once contact has been initiated, no assistance or advice will be available to the squad. DC-1, C-1, C-2, and MM will collect data specified on their respective forms. Casualties assessed during the exercise will remove their helmets and remain in place until released by the senior controller (C-1).

b. The OPPFORs will move toward the squad hasty defense position. The OPPFOR will only open fire on the squad if (1) at least one of the OPPFORs has crossed Phase Line D or (2) if the squad opens fire on the OPPFORs before anyone has crossed Phase Line D.

c. If the squad fires for suppressive effect the OPPFORs will be suppressed by that fire. C-3 and C-4 will insure that OPPFORs remain "down" during any delivery of a heavy volume/rate of fire. C-3 and C-4 will call "suppress" each time, in their judgment, that the OPPFORs would have been suppressed by incoming fire. OPPFORs will remain "down" for approximately 3 seconds following each "suppress" call by C-3 and/or C-4. Any OPPFOR not responding to a suppress call will be assessed a casualty by the nearest controller. The same rules and procedures apply to the tested squad and C-1/C-2.

End of Exercise

a. The engagement will continue until all OPPFORs or all squad members are assessed casualties. C-1 will call the NCS and inform him that the exercise has been terminated and the NCS will log the time of this communication. All squad and OPPFOR casualties will remain in place until released to the assistant operations NCO by the senior controller (C-1).

b. Upon termination of the exercise, DC-1, C-1, C-2, and MM will complete their respective data forms. DC-1 will call DC-3 and inform him that the exercise has ended, and DC-3 will join the other controllers and data collectors to complete the exercise narrative form. C-1 will call NCS, and the NCS will bring the NCS form to the defensive site for error correction and for completion of the exercise narrative.

c. When NCS receives the message that the exercise has ended, he will inform the OIC and assistant operations NCO. The assistant operations NCO will move to the defensive site to take charge of the tested squad. When informed by DC-1 that all data collection forms have been completed to the extent requiring the presence of the squad, the assistant operations NCO will take charge of the squad and move them to the administrative area for helmet cover, scope, and ammunition turn-in.

d. The completion of the exercise narrative will be the responsibility of DC-1. C-1, C-2, C-3, C-4, DC-3, and MM and NCS will contribute to the completion of the form. While at the defensive site, the parts of the narrative dealing with the Danger Area, OP, and Hasty Defense will be completed in that order. When the Danger Area part has been completed, DC-3 will turn in his data collection form to DC-1 and will be released to return to his station and complete preparations for the next squad. When the OP and Hasty Defense parts have been completed, C-3 and C-4 will be released and will supervise the preparation of the OP and Hasty Defense site for the next squad. C-3 will turn in his data collection form to DC-1.

e. DC-1, C-1, C-2, MM, and NCS will then return to the administrative area, and will complete the exercise narrative forms, check them for completeness, make sure all forms are present, and insert and seal them in a data envelope. Forms/maps from C-1, C-2, MM, and NCS will be collected from those individuals; forms from C-3, DC-2, and DC-3 will have been turned in to DC-1 at the hasty defense site.

APPENDIX D

DATA COLLECTION FORMS

CONTROLLER DATA COLLECTION FORM #1A

Date _____ Time _____

Trial _____ Lane _____

Name _____ Test: Pre Post
(Circle one)

Squad ID _____

ASSEMBLY AREA

Check When Completed

1. Call Net Control as squad enters Assembly Area. _____

2. Call Net Control when squad completes setting up perimeter. _____

4. Was infiltrator reported to squad or element leader? Yes (2) No (1) N/Obs. (0) _____

5. How was security maintained during delivery of order to squad? Note any breaches in security of perimeter.

_____

_____

_____

_____

_____

6. Did the squad member accurately repeat specified elements of order?

Element 1 Enemy Situation — Yes (2) No (1) N/Obs. (0) _____

Element 2 Mission — Yes (2) No (1) N/Obs. (0) _____

_____
Player Helmet Number
FTL A

Element 3 Route — Yes (2) No (1) N/Obs. (0) _____

Element 4 Call Sign — Yes (2) No (1) N/Obs. (0) _____

Listen to the Squad Leader deliver his order and describe:

a. Enemy/Friendly Situation.

b. Mission.

c. Leader Responsibilities - Fire Team "A".

d. Leader Responsibilities - Fire Team "B".

e. Point.

f. Flank Security.

g. Navigation/Route.

h. Movement Technique/Formation.

i. Chain of Command.

j. Signals/Communications.

k. Other.

RATE THE SQUAD ON THE FOLLOWING FROM ARRIVAL IN ASSEMBLY AREA TO DEPARTURE.

	Not Observed	Not Judged	
Command/Control/Communication:			
7. In establishing their sector of the platoon perimeter the squad was Very Organized 1 2 3 4 5 6 7 Very Disorganized	(0)	(8)	
Surveillance:			
8. How well did squad positions permit observation of their assigned area to the front Excellent 1 2 3 4 5 6 7 Extremely Poor	(0)	(8)	
9. While manning the assembly area security positions, the squad was alert and observing the area to their front All of the time 1 2 3 4 5 6 7 None of the time	(0)	(8)	
Vulnerability:			
10. The concealment of fighting positions was Excellent 1 2 3 4 5 6 7 Extremely Poor	(0)	(8)	

AT THE LINE OF DEPARTURE (LD)

11. From LD to Phase Line A, how many times did the element leader communicate with the squad members? (Tally: _____)

_____ (Number) (xx) _____

12. Call Net Control as the point element crosses LD.

_____ (Check when completed)

13. How far is point ahead of squad? (Enter "x" if you could not observe.)

_____ (Meters) (xxx) _____

14. Was the element leader part of the point?

Yes	No	N/Obs.
(2)	(1)	(0)

_____

15. Is the point man covered by at least one other man?

Yes	No	N/Obs.
(2)	(1)	(0)

_____

16. From LD to Phase Line A, are three or more men in your element within 10 meters of one another? (Tally: _____)

_____ (Number) (x) _____

AT PHASE LINE A

17. Call NCS when point crosses Phase Line A.

(Check when completed)

18. From Phase Line A to Potential Threat, how many times did the element leader communicate with the squad? (Tally: _____)

(Number) (x)

19. Are 3 or more men in your element within 10 meters of one another? (Tally: _____)

(Number) (x)

20. Number of men in your element with which your element leader has visual contact. (Enter "x" if you could not observe.)

(Number) (x)

21. How far is point ahead of squad? (Enter "x" if you could not observe.)

(Meters) (xxx)

22. Was the element leader part of the point?

Yes	No	N/Obs.
(2)	(1)	(0)

23. Is point man covered by at least one man?

Yes	No	N/Obs.
(2)	(1)	(0)

24. Number of men in your element moving in the open. (Enter "x" if you could not observe.) (Tally: _____)

(Number) (x)

AT THE POTENTIAL THREAT

25. From the Potential Threat to Danger Area, how many times did the element leader communicate with the squad members? (Tally: _____)

_____ (Number) (xx)

26. Did the squad investigate the potential threat? Yes (2) No (1) N/Obs. (0)

27. Did your element provide overwatch for the investigating element? Yes (2) No (1) N/Obs. (0)

AT THE DANGER AREA

28. Call Net Control when point element reaches Danger Area.

_____
(Check when completed)

29. From arrival at Danger Area to initiation of contact, how many times did element leader communicate with squad members? (Tally: _____)

_____ _____
(Number) (xx)

	Yes	No	N/Obs.	
30. Does the point element stop before entering Danger Area?	(2)	(1)	(0)	_____
31. Were overwatch positions established before anyone crossed the Danger Area?	(2)	(1)	(0)	_____
35. Did the point detect OPPFOR before contact?	(2)	(1)	(0)	_____

UPON CONTACT WITH FIRST OP

37. Did the element leader direct element members throughout the engagement? Yes (2) No (1) N/Obs. (0) _____

38. When contact was initiated your element

a. Maneuvered as a team _____(3)

b. Formed base of fire _____(2)

c. Acted as individuals _____(1)

d. Could not observe _____(0)

39. During the engagement, did your element perform as an integrated team? Yes (2) No (1) N/Obs. (0) _____

40. Did your element provide covering fire for the point element? Yes (2) No (1) N/Obs. (0) _____

41. When contact was initiated, did your element immediately

a. take cover Yes (2) No (1) N/Obs. (0) _____

b. return fire Yes (2) No (1) N/Obs. (0) _____

42. Does point element provide information about OPPFOR to:

your element leader Yes (2) No (1) N/Obs. (0) _____

your squad leader Yes (2) No (1) N/Obs. (0) _____

42a. From end of engagement at Danger Area to contact near OP, how many times did the element leader communicate with squad members?
(Tally: _____)

_____ (Number) (xx)

AT CONTROL PHASE LINE C

43. Was OP detected:

a. Before anyone crossed Phase Line C _____(3)

b. After crossing C but before OP opened fire _____(2)

c. After OP opened fire _____(1)

d. Could not observe _____(0)

44. Approximate range of detection of OP. (Enter "x" if you could not observe.)

_____ (Meters) (xxx)

	Yes	No	N/Obs.
45. When contact was initiated did your element immediately take cover?	(2)	(1)	(0)
46. When contact was initiated did element immediately return fire?	(2)	(1)	(0)

AT THE OP

47. Call Net Control when first man reaches OP.

_____ (Check when completed)

47a. Call NCS when attack is ended.

_____ (Check when completed)

RATE THE SQUAD ON THE FOLLOWING FROM LEAVING THE ASSEMBLY AREA TO INITIATION OF ENGAGEMENT.

	Not Observed	Not Judged	
Surveillance:			
48. During this movement phase your element was observing to its flanks All of the time — None of the time 1 2 3 4 5 6 7	(0)	(8)	
Mobility:			
49. The movement of your element given the terrain and situation was Too slow — Too fast 1 2 3 4 5 6 7	(0)	(8)	
50. During this phase of the exercise, overwatch of the point element was maintained All of the time — None of the time 1 2 3 4 5 6 7	(0)	(8)	

Command/Control/Communication:

	Not Observed	Not Judged	
51. Your element leader had control of the element movement			
All of the time 1 2 3 4 5 6 7 None of time	(0)	(8)	
52. Your element leader had control of his men			
All of the time 1 2 3 4 5 6 7 None of the time	(0)	(8)	
53. Squad leader was immediately informed of all tactically significant events			
All of the time 1 2 3 4 5 6 7 None of the time	(0)	(8)	
54. When element leader gave a command, element members responded			
Immediately 1 2 3 4 5 6 7 Very much delay	(0)	(8)	

RATE THE SQUAD ON THE FOLLOWING FROM INITIATION OF CONTACT TO ARRIVAL AT OP.

Command/Control/Communication:

	Not Observed	Not Judged	
55. Your element leader had control of the element movement All of the time — None of time 1 2 3 4 5 6 7	(0)	(8)	
56. Your element leader had control of his men All of the time — None of the time 1 2 3 4 5 6 7	(0)	(8)	
57. Squad leader was immediately informed of all tactically significant events All of the time — None of the time 1 2 3 4 5 6 7	(0)	(8)	
58. When element leader gave a command, element members responded Immediately — Very much delay 1 2 3 4 5 6 7	(0)	(8)	
59. The element's reaction to contact was Extremely Organized — Extremely Disorganized 1 2 3 4 5 6 7	(0)	(8)	

Firepower:

60. During fire and movement, suppressive fire was

Used Very Effect-ively						Not used	Not Observed	Not Judged
1	2	3	4	5	6	7	(0)	(8)

61. During fire and movement, the number of people firing in your element was

All Element Members						None of the Element Members		
1	2	3	4	5	6	7	(0)	(8)

62. During fire and movement the rate of fire was

Continuous						Extremely Intermittent		
1	2	3	4	5	6	7	(0)	(8)

63. During fire and movement, fire was directed at the enemy

Always						Never		
1	2	3	4	5	6	7	(0)	(8)

SQUAD HELMET NUMBERS (HASTY DEFENSE)

	Team A	Team B
SL _____	Leader _____	Leader _____
MG _____	_____	_____
AMG _____	_____	_____
	_____	_____

OPFOR

_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

PREPARATION OF THE HASTY DEFENSE

63a. Call NCS when squad arrives at Hasty Defense site. _____ (Check when completed)

	Yes (2)	No (1)	N/Obs. (0)	
64. Is there a covered/concealed route from OP to defensive line?				_____
65. Communication between OP and defensive line was:				
a. Visual				_____
b. Voice				_____
c. Other				_____

AT THE END OF THE EXERCISE

RATE THE SQUAD ON THE FOLLOWING FROM ARRIVAL AT THE OP THROUGH THE END OF THE EXERCISE.

Not Observed | Not Judged

Surveillance:

66. How well did squad positions permit observation of the area to their front

Excellent — Extremely Poor

1 2 3 4 5 6 7 ___ (0) ___ (8) ____

67. While in their fighting positions squad members were alert and observing the area to their front

All of the time — None of the time

1 2 3 4 5 6 7 ___ (0) ___ (8) ____

Vulnerability:

68. The concealment of the squads fighting positions was

Excellent — Extremely Poor

1 2 3 4 5 6 7 ___ (0) ___ (8) ____

69. The organization and strengthening of the captured position was

Excellent						Extremely Poor	Not Observed	Not Judged
1	2	3	4	5	6	7	(0)	(8)

Command/Control/Communication:

70. Adequacy of communication among fighting positions was

Excellent						Extremely Poor		
1	2	3	4	5	6	7	(0)	(8)

71. Squad reaction to attack was

Very Well Controlled						Uncontrolled		
1	2	3	4	5	6	7	(0)	(8)

72. During the attack your element responded to leader commands

Immediately						Very much delay		
1	2	3	4	5	6	7	(0)	(8)

RATE THE SQUAD ON THE FOLLOWING FOR THE ENTIRE EXERCISE.

	Not Observed	Not Judged	
73. The overall control of the squad during this exercise was Excellent 1 2 3 4 5 6 7 Extremely Poor	(0)	(8)	
74. The overall motivation (enthusiasm) of this squad was Extremely High 1 2 3 4 5 6 7 Extremely Low	(0)	(8)	
75. Overall, the squad's performance was Extremely Aggressive 1 2 3 4 5 6 7 Extremely Passive	(0)	(8)	
76. In general, the squad was Extremely Careful 1 2 3 4 5 6 7 Extremely Careless	(0)	(8)	
77. The overall tactical performance of the squad in this exercise was Excellent 1 2 3 4 5 6 7 Extremely Poor	(0)	(8)	

CONTROLLER DATA COLLECTION FORM #2A

Date _____ Time _____

Trial _____ Lane _____

Name _____ Test: Pre Post
(Circle one)

Squad ID _____

ASSEMBLY AREA

	Yes (2)	No (1)	N/Obs. (0)	
1. Was infiltrator reported to squad or element leader?				_____
2. How was security maintained during delivery of order to squad? Note any breaches in perimeter security.				
_____				
_____				
_____			_____	_____
_____				
_____				
_____				
3. Call Net Control when Platoon Leader has finished briefing.			_____ (Check When Completed)	
4. Did squad member accurately repeat specified elements of order?				
Element 1 Enemy Situation	Yes (2)	No (1)	N/Obs. (0)	_____
Element 2 Mission	Yes (2)	No (1)	N/Obs. (0)	_____
Element 3 Route	Yes (2)	No (1)	N/Obs. (0)	_____
Element 4 Call Sign	Yes (2)	No (1)	N/Obs. (0)	_____

_____
Player Helmet Number
FTL B

RATE THE SQUAD ON THE FOLLOWING FROM ARRIVAL IN ASSEMBLY AREA TO DEPARTURE.

Not Observed | Not Judged

Command/Control/Communication:

5. In establishing their sector of the platoon, the squad was

Very Organized ... Very Disorganized

1 2 3 4 5 6 7

(0) (8) ____

Surveillance:

6. How well did the squad positions permit observation of their assigned area to the front

Excellent ... Extremely Poor

1 2 3 4 5 6 7

(0) (8) ____

7. While manning the assembly area security positions, the squad was alert and observing the area to their front

All of the time ... None of the time

1 2 3 4 5 6 7

(0) (8) ____

Vulnerability:

8. The concealment of fighting positions was

Excellent ... Extremely Poor

1 2 3 4 5 6 7

(0) (8) ____

9. Call Net Control when first squad member leaves the perimeter.

_____
(Check when completed)

10. Call Net Control as last man leaves the perimeter to move to LD.

_____
(Check When Completed)

THE LINE OF DEPARTURE (LD)

11. From LD to Phase Line A, how many times did the element leader communicate to squad members? (Tally: _____)

_____ _____
(Number) (xx)

12. Distance between principal squad elements. (Enter "x" if you could not observe.)

_____ _____
(Meters) (xxx)

13. Distance between squad right and left flank. (Enter "x" if you could not observe.)

_____ _____
(Meters) (xxx)

14. Are 3 or more men in your element within 10 meters of one another? (Tally: _____)

_____ _____
(Number) (x)

AT PHASE LINE A

15. From Phase Line A to Potential Threat, how many times did the element leader communicate with squad members? (Tally: _____)

_____ _____
(Number) (xx)

16. Distance between principal elements? (Enter "x" if you could not observe.)

_____ _____
(Meters) (xxx)

17. Distance between right and left flanks. (Enter "x" if you could not observe.)

_____ _____
(Meters) (xxx)

18. Number of men in your element moving in the open. (Enter "x" if you could not observe.)

_____ _____
(Number) (x)

19. Number of men in your element with which your element leader has visual contact. (Enter "x" if you could not observe.)

_____ _____
(Number) (x)

20. Are 3 or more men in your element within 10 meters of one another?
(Tally: _____)

_____ _____
(Number) (x)

AT THE POTENTIAL THREAT

21. From Potential Threat to Danger Area, how many times did the element leader communicate with squad members? (Tally: _____)

_____ _____
(Number) (xx)

22. If the squad investigated the potential threat, did your element provide overwatch for the lead element?

Yes	No	N/Obs.	
(2)	(1)	(0)	_____

AT THE DANGER AREA

22a. Did anyone investigate claymore?

Yes	No	N/Obs.
(2)	(1)	(0)

23. From arrival at Danger Area to initiation of contact, how many times did element leader communicate with squad members? (Tally: _____)

_____ (Number) (xx)

24. Is M-60 positioned to provide coverage of the area before point element crosses?

Yes	No	N/Obs.
(2)	(1)	(0)

25. Number of instances of 3 or more men within 10 meters of one another (in the entire squad). (Enter "x" if you could not observe.) (Tally: _____)

_____ (Number) (x)

26. Distance between flank elements as point crosses danger area.

_____ (Meters) (xxx)

29. Did a squad member other than the point element investigate the claymore?

Yes	No	N/Obs.
(2)	(1)	(0)

UPON CONTACT WITH FIRST OP

	Yes (2)	No (1)	N/Obs. (0)	
31. Did element leader direct element members through the engagement?				_____
32. During contact, your element				
a. maneuvered	_____ (3)			
b. formed a base of fire	_____ (2)			_____
c. acted as individuals	_____ (1)			
d. could not observe	_____ (0)			
33. During the engagement, did your element perform as an integrated team?	Yes (2)	No (1)	N/Obs. (0)	_____
34. Did your element provide covering fire for the lead element?	Yes (2)	No (1)	N/Obs. (0)	_____
35. When contact was initiated, did your element immediately:				
a. take cover	Yes (2)	No (1)	N/Obs. (0)	_____
b. return fire	Yes (2)	No (1)	N/Obs. (0)	_____

35a. From end of engagement at Danger Area to contact at OP, how many times did the element leader communicate with the squad members?

_____ (Number) (x) _____

AT CONTROL PHASE LINE C

	Yes	No	N/Obs.	
36. Was overwatch provided for lead element by your element?	(2)	(1)	(0)	_____
37. When contact was initiated did your element immediately take cover?	(2)	(1)	(0)	_____

AT THE OP

RATE THE SQUAD ON THE FOLLOWING FROM LEAVING THE ASSEMBLY AREA TO INITIATION OF THE ENGAGEMENT AT THE OP.

Surveillance:

38. During this movement phase your element was observing to its front and flanks

All of the time						None of the time	Not Observed	Not Judged
1	2	3	4	5	6	7	(0)	(8)

Mobility:

39. The movement of your element given the terrain and situation was

Too slow						Too fast		
1	2	3	4	5	6	7	(0)	(8)

40. During this phase of the exercise, overwatch of the lead element was maintained

All of the time						None of the time		
1	2	3	4	5	6	7	(0)	(8)

Command/Control/Communication:

41. Your element leader had control of the element movement

All of the time						None of the time		
1	2	3	4	5	6	7	(0)	(8)

42. Your element leader had control of his men

All of the time						None of the time	Not Observed	Not Judged
1	2	3	4	5	6	7	(0)	(8)

43. Squad leader was immediately informed of all tactically significant events

All of the time						None of the time		
1	2	3	4	5	6	7	(0)	(8)

44. When element leader gave a command, element members responded

Immediately						Very much delay		
1	2	3	4	5	6	7	(0)	(8)

RATE THE SQUAD ON THE FOLLOWING FROM INITIATION OF CONTACT TO ARRIVAL AT OP.

	Not Observed	Not Judged	
45. Your element leader had control of the element movement All of the time 1 2 3 4 5 6 7 None of the time	(0)	(8)	
46. Your element leader had control of his men All of the time 1 2 3 4 5 6 7 None of the time	(0)	(8)	
47. Squad leader was immediately informed of all tactically significant events All of the time 1 2 3 4 5 6 7 None of the time	(0)	(8)	
48. When element leader gave a command, element members responded Immediately 1 2 3 4 5 6 7 Very much delay	(0)	(8)	
49. The element's reaction to contract was Extremely Organized 1 2 3 4 5 6 7 Extremely Disorganized	(0)	(8)	

Firepower:

							Not Observed	Not Judged	
50. During fire and movement, suppressive fire was									
Used Very Effect-ively						Not used			
1	2	3	4	5	6	7	(0)	(8)	
51. During fire and movement, number of people firing your element was									
All Element Members						None of the Element Members			
1	2	3	4	5	6	7	(0)	(8)	
52. During fire and movement the rate of fire was									
Contin-uous						Extremely Inter-mittent			
1	2	3	4	5	6	7	(0)	(8)	
53. During fire and movement, fire was directed at the enemy									
Always						Never			
1	2	3	4	5	6	7	(0)	(8)	

SQUAD HELMET NUMBERS (HASTY DEFENSE)

	Team A	Team B
SL _____	Leader _____	Leader _____
MG _____	_____	_____
AMG _____	_____	_____
	_____	_____

OPFOR (HASTY DEFENSE)

_____ _____ _____ _____ _____

_____ _____ _____ _____ _____

PREPARATION FOR THE HASTY DEFENSE

54. Number of positions without visual contact with either ny adjacent position. (Enter "x" if you could not observe.) (Tally: _____)

_____ _____
(Number) (x)

AT THE END OF THE EXERCISE

RATE THE SQUAD ON THE FOLLOWING FROM ARRIVAL AT OP THROUGH THE END OF THE EXERCISE.

Surveillance:

55. How well did squad positions permit observation of the area to their front

Excellent — Extremely Poor

1 2 3 4 5 6 7

Not Observed (0) Not Judged (8) _____

56. While in their fighting positions squad members were alert and observing the area to their front

All of the time — None of the time

1 2 3 4 5 6 7

(0) (8) _____

Vulnerability:

57. The concealment of the squad's fighting position was

Excellent — Extremely Poor

1 2 3 4 5 6 7

(0) (8) _____

58. The organization and strengthening of the captured position was

Excellent — Extremely Poor

1 2 3 4 5 6 7

(0) (8) _____

Command/Control/Communication:

59. Adequacy of communication among fighting positions

Excellent — Extremely Poor

1 2 3 4 5 6 7

Not Observed (0) Not Judged (8) ____

60. Squad reaction to attack was

Extremely Well Controlled — Extremely Poorly Controlled

1 2 3 4 5 6 7

Not Observed (0) Not Judged (8) ____

61. During the attack your element responded to leader commands

Immediately — Very much delay

1 2 3 4 5 6 7

Not Observed (0) Not Judged (8) ____

RATE THE SQUAD ON THE FOLLOWING FOR THE ENTIRE EXERCISE.

62. The overall tactical performance of the squad in this exercise was

Excellent						Extremely Poor	Not Observed	Not Judged
1	2	3	4	5	6	7	(0)	(8)

63. The overall control of the squad during this exercise was

Excellent						Extremely Poor		
1	2	3	4	5	6	7	(0)	(8)

64. The overall motivation (enthusiasm) of this squad was

Extremely High						Extremely Low		
1	2	3	4	5	6	7	(0)	(8)

65. Overall, the squad's performance was

Extremely Aggressive						Extremely Passive		
1	2	3	4	5	6	7	(0)	(8)

66. In general, the squad was

Extremely Careful						Extremely Careless		
1	2	3	4	5	6	7	(0)	(8)

DATA COLLECTION FORM #3A

Date _____ Time _____

Trial _____ Lane _____

Name _____ Test: Pre Post
(Circle one)

Squad ID _____

Squad Helmet Numbers

Squad Leader ____	Point ____	Squad Member ____
Element Leader ____	Squad Member ____	Squad Member ____
Element Leader ____	Squad Member ____	Squad Member ____
		Squad Member ____

ASSEMBLY AREA

1. Squad deployment was:	a. directed by squad leader	Yes (2)	No (1)	N/Obs. (0)	_____
	b. directed by element leader	Yes (2)	No (1)	N/Obs. (0)	_____
2. Sectors of fire were assigned by:					
	a. squad leader	Yes (2)	No (1)	N/Obs. (0)	_____
	b. element leader	Yes (2)	No (1)	N/Obs. (0)	_____
3. Number of positions without visual contact with either adjacent position. (Tally: _____.) (Enter "x" if not observed.)		_____ (Number) (x)			_____
4. Did element leader accurately report specified elements of order?	Element 1 Enemy Situation	Yes (2)	No (1)	N/Obs. (0)	_____
	Element 2 Mission	Yes (2)	No (1)	N/Obs. (0)	_____
	Element 3 Route	Yes (2)	No (1)	N/Obs. (0)	_____
	Element 4 Call Sign	Yes (2)	No (1)	N/Obs. (0)	_____

_____
Player Helmet Number
Machine Gunner

From positions one through "n" indicate whether each could observe the following locations. Enter a check where observation is possible. Enter "0" where not possible.

LANE #1

Location	Position 1	2	3	4	5	6	7	8
Hill Left								
Hill Center								
Hill Right								
Road to Front								
Intersection								

LANE #2

Location	Position 1	2	3	4	5	6	7	8
Far Left								
Brushline								
Far Right								

AT THE LINE OF DEPARTURE (LD)

6. From LD to Phase Line A, how many times did the squad leaders communicate with squad members? (Tally: _____)

(Number) (xx) _____

7. Can squad leader see:

a. lead element leader	Yes (2)	No (1)	N/Obs. (0)	_____
b. trailing element leader	Yes (2)	No (1)	N/Obs. (0)	_____

8. Is the squad leader controlling the squad:

a. directly	Yes (2)	No (1)	N/Obs. (0)	_____
b. through element leader	Yes (2)	No (1)	N/Obs. (0)	_____

9. Can the squad leader see at least one member of lead element?	Yes (2)	No (1)	N/Obs. (0)	_____

AT PHASE LINE A

10. From Phase Line A to Potential Threat, how many times did squad leader communicate with squad member?
(Tally: _____)
_____ (Number) (xx) _____

11. Can squad leader see:

		Yes	No	N/Obs.	
a.	leading element leader	(2)	(1)	(0)	_____
b.	trailing element leader	(2)	(1)	(0)	_____

12. Is the squad leader controlling his squad:

		Yes	No	N/Obs.	
a.	directly	(2)	(1)	(0)	_____
b.	through element leaders	(2)	(1)	(0)	_____

13. The squad was employing

a.	traveling formation	_____	(3)
b.	traveling overwatch	_____	(2) _____
c.	bounding overwatch	_____	(1)
d.	could not judge/ observe	_____	(0)

	Yes	No	N/Obs.	
14. Can the squad leader see at least one member of lead element?	(2)	(1)	(0)	_____

AT THE POTENTIAL THREAT

15. From Potential Threat to Danger Area, how many times did the squad leader communicate with squad members?

_____ _____
(Number) (xx)

16. Was intelligence item reported to the squad leader?

Yes (2) No (1) N/Obs. (0) _____

17. Number of instances of 3 or more men within 10 meters of one another? (Enter "x" if not observed.) (Tally: _____)

_____ _____
(Number) (x)

AT THE DANGER AREA

18. From arrival at Danger Area to initiation of contact, how many times did the squad leader communicate with the squad members?
(Tally: _____)

_____ (Number) (xx) _____

19. Was the squad leader informed of the Danger Area before anyone crossed? Yes (2) No (1) N/Obs. (0) _____

20. Number of men covering Danger Area before anyone crossed? (Enter "x" if not observed.)

_____ (Number) (xx) _____

21. After investigation by point, is squad leader informed that the area is clear (before main body of squad crosses)? Yes (2) No (1) N/Obs. (0) _____

22. Did squad leader receive a report of the claymore?

a. from Point Yes (2) No (1) N/Obs. (0) _____

b. from other squad members Yes (2) No (1) N/Obs. (0) _____

23. Does squad cross the Danger Area:

a. singly or in a dispersed group Yes (2) No (1) N/Obs. (0) _____

b. in a small bunch Yes (2) No (1) N/Obs. (0) _____

24. Did anyone detect OPPFOR before contact? Yes (2) No (1) N/Obs. (0) _____

UPON CONTACT WITH FIRST OP

25. From beginning to end of engagement, how many times did squad leader communicate with squad members? (Tally: _____)

_____ (Number) (xx) _____

26. Number of smoke grenades used? (Tally: _____)

_____ (Number) (x) _____

27. Did squad employ hand grenades?

Yes	No	N/Obs.	
(2)	(1)	(0)	_____

28. When contact was initiated was the squad leader with

a. point element _____(3)

b. lead element _____(2) _____

c. trailing element _____(1)

d. could not observe _____(0)

29. When contact was initiated the squad:

a. stalled in place _____(3)

b. began fire and maneuver as teams _____(2) _____

c. fired and moved as individuals _____(1)

d. could not observe _____(0)

30. Did the squad leader direct one element to form a base of fire?

Yes	No	N/Obs.	
(2)	(1)	(0)	_____

31. Did squad leader direct one element to maneuver against the OPPFOR?

Yes	No	N/Obs.	
(2)	(1)	(0)	_____

32. Did one fire team mask the fire of another fire team?

Yes	No	N/Obs.	
(2)	(1)	(0)	_____

33. Did the squad leader control the squad:

a. directly	Yes (2)	No (1)	N/Obs. (0)	_____
b. through fire team leaders	Yes (2)	No (1)	N/Obs. (0)	_____

34. Was the M-60 employed?

Yes (2)	No (1)	N/Obs. (0)	_____

NEAR CONTROL PHASE LINE C

	Yes	No	N/Obs.	
35. If OP was detected before contact was initiated; was squad leader informed of OP? (If not applicable, indicate not observed.)	(2)	(1)	(0)	_____

CONTACT WITH OPPFORS

36. From beginning to end of engagement, how many times did the squad leader (or acting squad leader if squad leader becomes a casualty) communicate with squad members? (Tally: _____)

_____ (Number) (xx) _____

37. Number of smoke grenades used. (Tally: _____)

_____ (Number) (xx) _____

38. When contact was initiated was the squad leader with

a. point element _____

b. lead element _____ _____

c. trailing element _____

d. could not observe _____

39. When contact was initiated, the squad

a. stalled in place for several minutes _____ (4)

b. withdrew _____ (3)

c. began fire and maneuver as a team _____ (2) _____

d. fired and moved as individuals _____ (1)

e. could not observe _____ (0)

40. Did squad leader direct one element to maneuver against OPPFOR?	Yes (2)	No (1)	N/Obs. (0)	_____
41. Did squad leader direct one element to form a base of fire?	Yes (2)	No (1)	N/Obs. (0)	_____

42. When contact was initiated did elements immediately take cover:

a. lead element	Yes (2)	No (1)	N/Obs. (0)	_____
b. trailing element	Yes (2)	No (1)	N/Obs. (0)	_____

43. Rounds fired during first minute of engagement. (Tally: _____)	(Number) (xx)			_____
44. Is all returning fire directed at OP?	Yes (2)	No (1)	N/Obs. (0)	_____
45. Did the squad employ M-60?	Yes (2)	No (1)	N/Obs. (0)	_____
46. As the engagement progressed, did element mask the fire of another element at any time?	Yes (2)	No (1)	N/Obs. (0)	_____
47. Did the squad leader control the squad:				
a. directly	Yes (2)	No (1)	N/Obs. (0)	_____
b. through element leaders	Yes (2)	No (1)	N/Obs. (0)	_____
48. If the squad leader was a casualty, did someone assume command immediately?	Yes (2)	No (1)	N/Obs. (0)	_____
49. When contact was initiated did point or other lead element member provide information about OPPFOR to the squad leader?	Yes (2)	No (1)	N/Obs. (0)	_____
50. Did the lead fire team perform as an integrated team?	Yes (2)	No (1)	N/Obs. (0)	_____
51. Did the trailing fire team perform as an integrated team?	Yes (2)	No (1)	N/Obs. (0)	_____
52. Did one element provide overwatch for another element throughout the attack?	Yes (2)	No (1)	N/Obs. (0)	_____
53. During the engagement did the squad employ suppressive fire?	Yes (2)	No (1)	N/Obs. (0)	_____

AT THE OP

		Yes (2)	No (1)	N/Obs. (0)	
54.	Does squad move past the objective?				_____
55.	Are initial security positions established?				_____
56.	Does squad leader get ammo count?				_____
57.	Does squad leader get casualty count?				_____
58.	Does squad leader attempt retrieval of weapons?				_____

Squad Helmet Numbers

Squad Leader ____	Point ____	Squad Member ____
Element Leader ____	Squad Member ____	Squad Member ____
Element Leader ____	Squad Member ____	Squad Member ____
		Squad Member ____

PREPARATION OF THE HASTY DEFENSE

59. Is an OP set out? Yes (2) No (1) N/Obs. (0) _____

60. Squad deployment was directed by

a. squad leaders Yes (2) No (1) N/Obs. (0) _____

b. element leaders Yes (2) No (1) N/Obs. (0) _____

61. Sectors of fire were assigned by

a. squad leader Yes (2) No (1) N/Obs. (0) _____

b. element leader Yes (2) No (1) N/Obs. (0) _____

CONDUCT OF THE DEFENSE

62. If detection was made before contact was initiated, what was the range of detection? (Enter "x" if not observed.)

_____ _____
(Meters) (xxx)

63. What was the range of the OPFORS when contact was initiated? (Enter "x" if not observed.)

_____ _____
(Meters) (xxx)

64. Was detection of OPPFORS reported to squad leader before contact?

Yes (2) No (1) N/Obs. (0) _____

65. Who opened fire first? (Enter "x" if not observed.)

a. Squad _____(1)

b. OPFORS _____(0) _____

66. At contact, how many OPPFORS were visible?

_____ _____
(Number) (xx)

67. Fire was opened with what weapon type?

_____ _____
(x)

68. Did a leader coordinate fire of the squad?

Yes (2) No (1) N/Obs. (0) _____

69. How many squad members could deliver fire on the OPPFORS at initial contact? (Enter "x" if you could not observe.)

_____ _____
(Number) (x)

70. Did a leader reassign positions during engagement?

Yes (2) No (1) N/Obs. (0) _____

71. How many claymores did the squad expend? (Enter "x" if you could not observe.)

_____ _____
(Number) (x)

72. How many grenades did the squad use? (Tally: _____)

_____ _____
(Number) (xx)

73. How many grenades did the OPPFORS use?

_____ _____
(Number) (xx)

NET CONTROL STATION FORM #9

Date _____ Name _____ Test: Pre Post (Circle one)

Trial _____ Time _____ Squad ID _____

SQUAD ROSTER (OP)

Position: SL TL TL MG AMG ____ ____ ____ ____ ____

Number: ____ ____ ____ ____ ____ ____ ____ ____ ____ ____

OPPFOR ROSTER

Position: Infl DgAr DgAr ____ ____ ____ ____ ____ ____ ____

Number: ____ ____ ____ ____ ____ ____ ____ ____ ____ ____

TIME	EVENT/COMMENT	ECC	REPORT POINT
X	Commo check, Controller 1		
X	Commo check, Controller 2		
X	Commo check, OPFOR 1		
X	Commo check, OPFOR 2		
	Squad enters Assembly Area (Controller 1)		
	Squad completes perimeter set up (Controller 1)		
	Platoon Leader Finish Briefing (Controller 2)		
	Infiltrator casualty (Firer #)		
	First man leaves perimeter (Controller 2)		
	Last man leaves perimeter (Controller 2)		
	Point man crosses Line of Departure (Controller 1)		
	Point crosses Phase Line A (Controller 1)		
	Point reaches Danger Area (Controller 1)		
	Danger Area casualty (Firer #) (Firer #)		

SQUAD ROSTER (OP)

Position: SL TL TL MG AMG ___ ___ ___ ___ ___

Number: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

OPPFOR ROSTER (OP)

Position: Infl DgAr DgAr ___ ___ ___ ___ ___ ___ ___

Number: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Weapons: R = M-16; M = M-60; G = Hand Grenade; C = Claymore

TARGET	FIRER	TIME	CONF	WPN	EVENT/COMMENT
X	X		X	X	First man reaches OP
X	X		X	X	End attack on OP (Controller 1)

SQUAD ROSTER (HASTY DEFENSE)

Position: SL TL TL MG AMB ___ ___ ___ ___ ___

Number: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

OPPFOR ROSTER (HASTY DEFENSE)

Position: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Number: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Weapons: R = M-16; M = M-60; G = Hand Grenade; C = Claymore

TARGET	FIRER	TIME	CONF	WPN	EVENT/COMMENT
X	X		X	X	Begin Hasty Defense (Controller 1)

SQUAD ROSTER (HASTY DEFENSE)

Position: SL TL TL MG AMG ___ ___ ___ ___ ___

Number: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

OPPFOR ROSTER (HASTY DEFENSE)

Position: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Number: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Weapons: R = M-16; M = M-60; G = Hand Grenade; C = Claymore

TARGET	FIRER	TIME	CONF	WPN	EVENT/COMMENT

APPENDIX E

TEST NARRATIVE

Delivery of the Order to Squad: The squad leader gave the order to his two fire team leaders who then disseminated it to their respective fire teams. He gave the order a second time to his RTO. He covered the enemy situation adequately. He gave the division and battalion mission. He did indicate that the platoon's mission was to reduce resistance and clear the ridge line. He covered the squad mission adequately. He indicated that the team's responsibilities in that A team would lay down a base of fire. The squad leader wanted everybody to go down and return fire while he assessed the situation and made the decisions. He didn't cover any other team responsibilities. There were no instructions to the point. Nothing about flank security. He did indicate that they would move along the ridge line to the west. He further indicated that A team would lead with the B team trailing. He did not mention the chain of command. He did not cover any signal or communications instructions. The machine gunner knew virtually nothing except they were going to move west along the ridge line. The B team leader knew generally what the mission was and the route to take. But he knew neither the platoon call sign nor enemy situation.

ASSEMBLY AREA

Selection of Positions: The positions were adequate: Good fields of observation, poor attempt to camouflage their positions, some non-tactical moving around, lackadaisical attitude in terms of actually maintaining observation to their front. At one point the infiltrator called over and he mentioned that he could only see one of the positions from his view point.

Security: They covered their sector well. Both flanks were covered and coverage in the middle was good. However, the squad was not looking out to their front. The security was minimal. They were in a good position and if anything happened, they could have reacted to it. They had good fields of fire. It was supported on both sides so if they did get attacked from a flank, etc. the machine gun would have been protected. The machine gunner himself was not alert. A few times they did get up and walk around. General alertness was very poor. One man right next to the machine gunner detected the infiltrator, but nothing was done about it.

Departure From the Assembly Area: The A team was leading. They were in a wedge formation. The team leader was the point. He was moving 25 to 30 meters in front of the squad leader as they crossed the line of departure. As they moved out he got disoriented a little.

The team leader did not have a compass and he went all the way from his right boundary across to his left boundary. The squad leader got him back. There was no attempt to cover the point man's movement. The two people walking with him on the wedge could see less than he could and they were not in a position to support him instantly if he got into trouble. He was moving rapidly and didn't pause at all to check the terrain. He moved fast until he was in the vicinity of Phase Line A, where he started moving more carefully and looking around. B team only had two members--the team leader and one other member. The machine gun crew was under the control of the squad leader. The squad was composed of an A team, a two-member B team, and the squad leader, RTO and machine gun crew. During movement, the B team leader followed behind the squad leader. Later on he went out in the left flank and ended up being out in front of the lead fire team.

Use of Cover/Concealment: They attempted to stay on one side of the ridge or the other. They also made an attempt to use the best terrain. However, their movement was so rapid they were moving upright and they did not take full advantage of it. There were a number of times where the people could be observed moving in the open from tree to tree. They did not use cover/concealment to the best advantage. They stopped several times during movement to have conferences. They did not have very much in the way of SOP as they had to stop and have a quick frag order with squad leader, both team leaders, RTO, and machine gunner and assistant machine gunner together, with no security.

Overwatch: They moved very rapidly and it was probably difficult to overwatch the forward elements. The only overwatch that was employed was at various danger areas when he would stop and physically set somebody up. During the movement the point man moved without anyone covering him.

Control: The B team leader was able to control the other member of his squad. They moved well as a team. He kept looking back to the squad leader for further instructions. The squad leader never gave him specifics. The "A" team leader was moving as the point. I assume his two other members were supposed to follow his lead which they did well. They moved and adjusted their pace with the fire team leader.

Communications: The communications from the squad leader to the other squad members were very good. The squad leader was much more directive about what he wanted to do. He also got a lot more feedback from his team leaders. When they noticed something it was brought to his attention and let him make a decision on it. Communications were kept throughout the entire exercise. Squad leader kept them informed using hand and arm signals. The squad leader was effective in getting his team to do what he wanted them to do. However, their execution wasn't all that sharp. His fire team leaders responded to him when he gave them a direction.

POTENTIAL THREAT

The potential threat wasn't really reacted to. One man turned around and looked at it point blank and then turned around and continued to move. When we were in the area of the potential threat the B team was on the left flank. Only members of A team could have seen the potential threat. The "A" team did spot it; however, there was no communication back to squad leader. They did not find the map.

DANGER AREA

Another conference was held. The point team saw the road and I believe the squad leader was up so close that he spotted it at the same time. He halted his entire squad. After a small conference the A team moved over to the right flank and set up some overwatch positions. The A team was providing security on the near side of the danger area. B team went over across the road. The first shot from the danger area OPFORs came when they were on the near side. B team at that time moved across the road and pursued the enemy. B team fired one or two shots and the enemy tried to withdraw and they pursued them and they ended up killing one OPFOR in position. They kept on going and did not notice the other one on the right flank. The A team noticed him (the other OPFOR) when he came up. Even though A team was providing security they were on the right flank and could not secure the area where the fire team crossed. They could provide security straight ahead. In effect, the B team actually crossed without having security. As soon as the firing started, the squad leader was aggressive at moving his entire squad across the road. All we heard was one long burst of M16 fire and a couple of shots. The squad leader's decision was to push everyone as quickly as he could across the road and they began fire and movement. The squad never saw the right flank danger man until he began to withdraw. Once the B team did get across the road and he saw the enemy OPFOR withdrawing, he communicated that back to squad leader. The squad leader then told him to check it out. The squad continued on and ended up killing the 2d OPFOR. No one on the left flank detected the claymore because they were moving too fast. The mapper indicated that the squad leader stepped right over the claymore. Later they reported the claymore. From movement to line of departure on they had a few problems in staying in the boundaries as they were off to the right flank somewhat. The squad leader did not have a compass and he was trying to guide them on the ridge line and obviously he was not able to do it that well. The squad leader's reaction to contact was a headlong rush into it. The squad leader did not wait for fire support from the machine gun. He committed people directly into the phase of the contact. Squad leader also didn't pay much attention to the machine gun and the extra fire power that he had. The machine gunner employed the machine himself when he thought it was necessary. At the danger area the squad leader told the machine gunner to set up suppressive fires. The location of the M60 was not a good one for employing it when it was desired to be employed. Only one smoke grenade was used.

CONTACT AT OP

Where was the point lead element about the time they were taken under fire? There was confusion over whether the squad knew they were supposed to move or not. The A team did not move and the B team did begin to move and in fact passed them up. At that point whether squad leader intended to or not he had his B team leading as they walked up into that OP. The B team moved out ahead of A team and kept on moving. The first shot came from the OP. Instead of getting down immediately they ran to a nearby tree and instead of staying there they continued their rush trying to get as close as possible to the enemy as they could. The B team ended up getting killed. The team leader was the first one killed and the other man was pinned down and couldn't move. He remained there until he was killed by a grenade. Just before the team leader was killed he was trying to get the M60 closer and closer to the OP. Actually where he was he could have delivered effective fire had he not been masked by the rest of the squad. The squad leader did indicate for A team to move up. They moved in on the right flank by long rushes. There was one smoke grenade employed. The machine gun had not opened up fire yet. The A team was deployed on the right flank and B team (left of center) was already hit and pinned down. Then the A team came under suppressive fire from the OPFOR machine gun, and were pinned down. They shifted to the right, again on their own. As they shifted to the right they lost the team leader and then they lost the second man crossing in the road on the right flank. At that point they were completely separated from the squad leader. At that point the machine gunner had a good field of fire and started to bring intermittent fire in on the OPFOR position and suppress them. The second man killed was the squad leader that's why there was no direction. The A team leader did understand the report that the squad leader was dead. He moved from his position on the right flank into the center to try to get the machine gun. At that point they started taking a lot of casualties. The "A" team leader then got separated from his two remaining people on the right flank. The acting squad leader on the left flank had a couple of people on the right flank completely separated. The team leader instructed those two people on the right flank to continue moving up and that's where they eventually got killed. The squad leader directed that the machine gun be brought up and bring down a base of fire. It seemed like it took a long time for the machine gunner to get set up and provide suppressive fires. Most of the squad had been killed. Either the machine gunner or his assistant (whichever one wasn't killed) tried to organize the last few people that were together. He yelled out for one man to pull back to his position and maneuver to the left. This man was pinned down in the middle and couldn't move and ended up getting killed by a grenade. There was some attempt to try to organize the thing with even just a few men alive. They were never within hand grenade distance except with that one last man. The team leader would have pulled those two remaining people on the right flank back around and gotten all those people together and had all those guns suppressing position two. The squad had split up and then began to get picked off. The

last man crossed the road and was moving in on the machine gun position. He had circled around it for about 15 minutes well within grenade range but was either hesitant to either try to fire or pull the grenades so we called the problem.

Cover/Concealment: It was very poor. Their idea of movement was long rushes upright in front of the positions. Three people got killed doing that. It was the same for B team. There was no attempt to use cover and concealment. When one man got pinned down he used the cover in front of him to good advantage but there was no way that he could move. When they were taken under fire the B team was ahead of the A team. The last man circled around on the extreme right hand side of the flank and got up reasonably close to the positions. The machine gunner himself was trying to move up into position most of the time. The assistant never kept up with him.

HASTY DEFENSE

Selection of Positions: Squad leader deployed one fire team on the left flank and the other fire team on the right flank. He positioned his machine gun on the far left flank covering the road and also had a field of fire clear across the front of the sector. The positions themselves were selected by the individual members. The only positions that the squad leader or team leaders selected were the two flank points and OP. The positions the squad leader selected on the right flank were reasonably good. It appeared that he realized that that was his major threat. He had a claymore employed on the right flank and another in the center. They were both aimed poorly but they were employed in the right place in terms of the potential threat. The people were alert and in a position to accept the attack. The OP had no communication. They elected not to use the wire and the telephone. The OP was behind some brush trying to watch and listen for the enemy. At one point he almost fell asleep. He heard the enemy coming up on the position at which time he grabbed a hand grenade. He waited a while then threw the smoke grenade and he did not wait for the smoke to build up or any cover whatsoever. As soon as he threw it, he tried to run back to the defensive position. He was immediately hit by the OPFOR. The use of smoke grenades to alert the squad to the OPFORs was his own idea.

Security: While they were watching to their front they detected the movement at the same time the OP did at the right flank positions. There were no instructions concerning the direction of attack. At that point contact began. The right flank positions did not have visual contact with the rest of the squad. There was one position on the right that could relay messages by voice. The rest of the squad didn't know what was going on on the right flank, but they could hear some fires and grenades going off. The squad leader had to ask what was going on over on the right flank. The man was hesitant to answer him because he was afraid to give his position away. In fact, he did

give away his position and was killed almost immediately. The people on the right flank began to make contact and initially started throwing grenades. It was a good move. The squad heard the OPFOR in front of them but they hadn't spotted them. They threw a couple of grenades that weren't effective. The right flank did shoot the point man of that particular OPFOR element. The group between the two flank positions were a little hasty in throwing their grenades. They made no attempt to find out exactly where the OPFOR was or even use suppressive fires in that direction. The squad leader had good control of the members who were in the immediate area of his vicinity as he called directions to his machine gunner to fire his final protective line across the front of their sector. He also called to get a report so he knew what was going on in the right flank. He could see the positions in the middle. Positions in the middle tried to keep the squad leader informed by pointing out what direction the enemy were in, where they were. The squad leader tried to use the M60 and he kept yelling at them to suppress and to fire as their final protection. The machine gunner himself fired only seldomly. The times the machine gunner did fire were good and it did suppress. When he did fire the machine gun the squad leader told him to fire the right flank. The machine gunner had made no attempt to move the gun. It always pointed straight out toward the center of the sector. There was only one man who was there. The machine gunner was reluctant to fire. He wanted to see targets. Obviously he didn't understand the suppressive capability of his gun. The right flank was wiped out before they had a chance to fire the right hand claymore. No one made an attempt to get over there and actually fire the claymore. The one in the middle was controlled by the B team leader. He was supposed to fire it. But both members in this position were killed and the squad leader himself came down from his position to take over the claymore and did fire it. However, no one was in the killing radius of the claymore.

SUMMARY JUDGMENTS

The squad leader had a good idea of what he wanted to do. His two fire team leaders, while they supported him, were less knowledgeable. Thus, the entire squad was dependent on the squad leader's knowledge of what to do. In many cases at the danger area, and at other times the squad leader had a good idea of what he wanted to do yet he was usually unable to accomplish it because the people just did not execute it very well. They were making attempts to do what he wished. The squad leader's perception of what he should do in contact was to close with that position as rapidly as he could with all his people and that is what led to the casualties. None of the squad members seemed to understand the necessity and the fire power that the machine gun offered and it was not used the way it should have been. Also when they were attacking the enemy position at the OP they did not respect the machine gun fire, they just ran headlong into it and tried to rush and get as close as possible without any

attempt to find out how many people were there, where the positions were, or anything else. After a few people had been killed there was an attempt by a few members who were left to pinpoint the positions and try to maneuver and organize things, but too few were left to do anything. Overall, the squad's tactical capabilities were good. They just moved in the open and were upright too much. Once they did come under fire they just went headlong right toward it and did not make any attempt to coordinate or anything, find out where the OP was, use their weapons, etc. This squad was sloppy in the execution of many things although the squad leader seemed to exert a good deal of control over the squad. He seemed to be quite directive and seemed to have good ideas of what to do but the squad was very slow responding to orders. The movement techniques were generally poor, and their employment of weapons, especially for suppression, was quite poor.

APPENDIX F

ANALYSIS OF VARIANCE SUMMARY TABLES

TABLE 1. Analysis of Variance for Number of Missions Accomplished

Source of Variation	SS	df	MS	F	P
A (Training Group)	2.53	1	2.53	15.81	<0.005
B (Test)	3.78	1	3.78	23.63	<0.001
A x B	2.54	1	2.54	15.88	<0.005
Between Cells	2.19	14	0.16		
Within Cells	2.18	14	0.16		
TOTAL	13.22	31			

TABLE 2. Analysis of Variance for Duration of OP Engagement

Source of Variation	SS	df	MS	F	P
A (Training Group)	1417.78	1	1417.78	4.79	<0.05
B (Test)	2719.53	1	2719.53	20.48	<0.001
A x B	1471.54	1	1471.54	11.08	<0.005
Between Cells	4147.44	14	296.25		
Within Cells	1859.43	14	132.82		
TOTAL	11615.72	31			

TABLE 3. Analysis of Variance for Evaluation by OPFOR Controllers of Caution

Source of Variation	SS	df	MS	F	P
A (Training Group)	15.13	1	15.13	9.06	<0.01
B (Test)	2.00	1	2.00	1.90	Not Significant
A x B	19.53	1	19.53	18.60	<0.001
Between Cells	23.34	14	1.67		
Within Cells	14.72	14	1.05		
TOTAL	74.72	31			

TABLE 4. Analysis of Variance for Evaluation by OPFOR Controllers of Use of Concealment

Source of Variation	SS	df	MS	F	P
A (Training Group)	8.00	1	8.00	3.39	Not Significant
B (Test)	7.03	1	7.03	7.48	<0.025
A x B	12.50	1	12.50	13.30	<0.005
Between Cells	32.97	14	2.36		
Within Cells	13.22	14	0.94		
TOTAL	73.72	31			

TABLE 5. Analysis of Variance for Pooled Measures of Performance at the OP

Source of Variation	SS	df	MS	F	P
A (Training Group)	50.0	1	50.0	20.92	
B (Test)	10.13	1	10.13	10.34	
A x B	36.12	1	36.12	36.86	
Between Cells	33.50	14	2.39		
Within Cells	13.75	14	0.98		
TOTAL	143.50	31			

TABLE 6. Analysis of Variance for Evaluation by OPFOR Controllers of Tactical Performance

Source of Variation	SS	df	MS	F	P
A (Training Group)	13.78	1	13.78	4.99	<0.05
B (Test)	0.13	1	0.13	0.07	Not Significant
A x B	10.12	1	10.12	5.44	<0.05
Between Cells	38.69	14	2.76		
Within Cells	26.00	14	1.86		
TOTAL	88.72	31			

TABLE 7. Analysis of Variance for Pooled Measures of Performance in the Hasty Defense

Source of Variation	SS	df	MS	F	P
A (Training Group)	9.03	1	9.03	5.07	<0.05
B (Test)	9.03	1	9.03	10.62	<0.01
A x B	19.54	1	19.54	22.99	<0.001
Between Cells	24.94	14	1.78		
Within Cells	11.93	14	0.85		
TOTAL	74.47	31			

TABLE 8. Analysis of Variance for Pooled Measures of Performance (OP and Hasty Defense Combined)

Source of Variation	SS	df	MS	F	P
A (Training Group)	101.53	1	101.53	22.31	<0.001
B (Test)	38.28	1	38.28	17.01	<0.005
A x B	108.79	1	108.79	48.35	<0.001
Between Cells	63.69	14	4.55		
Within Cells	31.43	14	2.25		
TOTAL	343.72	31			

DISTRIBUTION

ARI Distribution List

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1 HQDA (DAPC-PAS-A)
1 HQDA (DUSA-OR)
1 HQDA (DAMO-RQR)
1 HQDA (DASG)
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1 Chief, Consult Div (DA-OTSG), Adelphi, MD
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1 HQ First Army, ATTN: AFKA-OI-TI
2 HQ Fifth Army, Ft Sam Houston
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1 Ofc Chief of Stf, Studies Ofc
1 DCSPER, ATTN: CPS/OCP
1 The Army Lib, Pentagon, ATTN: RSB Chief
1 The Army Lib, Pentagon, ATTN: ANRAL
1 Ofc, Asst Sect of the Army (R&D)
1 Tech Support Ofc, OJCS
1 USASA, Arlington, ATTN: IARD-T
1 USA Rsch Ofc, Durham, ATTN: Life Sciences Dir
2 USARIEM, Natick, ATTN: SGRD-UE-CA
1 USATTC, Ft Clayton, ATTN: STETC-MO-A
1 USAIMA, Ft Bragg, ATTN: ATSU-CTD-OM
1 USAIMA, Ft Bragg, ATTN: Marquat Lib
1 US WAC Ctr & Sch, Ft McClellan, ATTN: Lib
1 US WAC Ctr & Sch, Ft McClellan, ATTN: Tng Dir
1 USA Quartermaster Sch, Ft Lee, ATTN: ATSM-TE
1 Intelligence Material Dev Ofc, EWL, Ft Holabird
1 USA SE Signal Sch, Ft Gordon, ATTN: ATSO-EA
1 USA Chaplain Ctr & Sch, Ft Hamilton, ATTN: ATSC-TE-RD
1 USATSCH, Ft Eustis, ATTN: Educ Advisor
1 USA War College, Carlisle Barracks, ATTN: Lib
2 WRAIR, Neuropsychiatry Div
1 DLI, SDA, Monterey
1 USA Concept Anal Agcy, Bethesda, ATTN: MOCA-MR
1 USA Concept Anal Agcy, Bethesda, ATTN: MOCA-JF
1 USA Arctic Test Ctr, APO Seattle, ATTN: STEAC-PL-MI
1 USA Arctic Test Ctr, APO Seattle, ATTN: AMSTE-PL-TS
1 USA Armament Cmd, Restone Arsenal, ATTN: ATSK-TEM
1 USA Armament Cmd, Rock Island, ATTN: AMSAR-TDC
1 FAA-NAFEC, Atlantic City, ATTN: Library
1 FAA-NAFEC, Atlantic City, ATTN: Hum Engr Br
1 FAA Aeronautical Ctr, Oklahoma City, ATTN: AAC-44 D
2 USA Fld Arty Sch, Ft Sill, ATTN: Library
1 USA Armor Sch, Ft Knox, ATTN: Library
1 USA Armor Sch, Ft Knox, ATTN: ATSB-DI-E
1 USA Armor Sch, Ft Knox, ATTN: ATSB-DT-TP
1 USA Armor Sch, Ft Knox, ATTN: ATSB-CD-AD
2 HQUSACDEC, Ft Ord, ATTN: Library
1 HQUSACDEC, Ft Ord, ATTN: ATEC-EX-E-Hum Factors
2 USAEEC, Ft Benjamin Harrison, ATTN: Library
1 USAPACDC, Ft Benjamin Harrison, ATTN: ATCP-HR
1 USA Comm-Elect Sch, Ft Monmouth, ATTN: ATSN-EA
1 USAEC, Ft Monmouth, ATTN: AMSEL-CT-HDP
1 USAEC, Ft Monmouth, ATTN: AMSEL-PA-P
1 USAEC, Ft Monmouth, ATTN: AMSEL-SI-CB
1 USAEC, Ft Monmouth, ATTN: C, Facl Dev Br
1 USA Materials Sys Anal Agcy, Aberdeen, ATTN: AMXSY-P
1 Edgewood Arsenal, Aberdeen, ATTN: SAREA-BL-H
1 USA Ord Ctr & Sch, Aberdeen, ATTN: ATSL-TEM-C
2 USA Hum Engr Lab, Aberdeen, ATTN: Library/Dir
1 USA Combat Arms Tng Bd, Ft Benning, ATTN: Ad Supervisor
1 USA Infantry Hum Rsch Unit, Ft Benning, ATTN: Chief
1 USA Infantry Bd, Ft Benning, ATTN: STEBC-TE-T
1 USASMA, Ft Bliss, ATTN: ATSS-LRC
1 USA Air Def Sch, Ft Bliss, ATTN: ATSA-CTD-ME
1 USA Air Def Sch, Ft Bliss, ATTN: Tech Lib
1 USA Air Def Bd, Ft Bliss, ATTN: FILES
1 USA Air Def Bd, Ft Bliss, ATTN: STEBD-PO
1 USA Cmd & General Stf College, Ft Leavenworth, ATTN: Lib
1 USA Cmd & General Stf College, Ft Leavenworth, ATTN: ATSW-SE-L
1 USA Cmd & General Stf College, Ft Leavenworth, ATTN: Ed Advisor
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: DepCdr
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: CCS
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: ATCASA
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: ATCACO-E
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: ATCACC-CI
1 USAECOM, Night Vision Lab, Ft Belvoir, ATTN: AMSEL-NV-SD
3 USA Computer Sys Cmd, Ft Belvoir, ATTN: Tech Library
1 USAMERDC, Ft Belvoir, ATTN: STSFB-DQ
1 USA Eng Sch, Ft Belvoir, ATTN: Library
1 USA Topographic Lab, Ft Belvoir, ATTN: ETL-TD-S
1 USA Topographic Lab, Ft Belvoir, ATTN: STINFO Center
1 USA Topographic Lab, Ft Belvoir, ATTN: ETL-GSL
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: CTD-MS
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATS-CTD-MS
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-TE
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-TEX-GS
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-CTS-OR
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-CTD-DT
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-CTD-CS
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: DAS/SRD
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-TEM
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: Library
1 CDR, HQ Ft Huachuca, ATTN: Tech Ref Div
2 CDR, USA Electronic Prvg Grd, ATTN: STEEP-MT-S
1 HQ, TCATA, ATTN: Tech Library
1 HQ, TCATA, ATTN: AT CAT-OP-Q, Ft Hood
1 USA Recruiting Cmd, Ft Sheridan, ATTN: USARCPM-P
1 Senior Army Adv., USAFAGOD/TAC, Elgin AF Aux Fld No. 9
1 HQ USARPAC, DCSPER, APO SF 96558, ATTN: GPPE-SE
1 Stimson Lib, Academy of Health Sciences, Ft Sam Houston
1 Marine Corps Inst., ATTN: Dean-MCI
1 HQUSMC, Commandant, ATTN: Code MTMT
1 HQUSMC, Commandant, ATTN: Code MPI-20-28
2 USCG Academy, New London, ATTN: Admission
2 USCG Academy, New London, ATTN: Library
1 USCG Training Ctr, NY, ATTN: CO
1 USCG Training Ctr, NY, ATTN: Educ Svc Ofc
1 USCG, Psychol Res Br, DC, ATTN: GP 1/62
1 HQ Mid-Range Br, MC Det, Quantico, ATTN: P&S Div

1 US Marine Corps Liaision Ofc, AMC, Alexandria, ATTN: AMCGS–F
1 USATRADOC, Ft Monroe, ATTN: ATRO–ED
6 USATRADOC, Ft Monroe, ATTN: ATPR–AD
1 USATRADOC, Ft Monroe, ATTN: ATTS–EA
1 USA Forces Cmd, Ft McPherson, ATTN: Library
2 USA Aviation Test Bd, Ft Rucker, ATTN: STEBG–PO
1 USA Agcy for Aviation Safety, Ft Rucker, ATTN: Library
1 USA Agcy for Aviation Safety, Ft Rucker, ATTN: Educ Advisor
1 USA Aviation Sch, Ft Rucker, ATTN: PO Drawer O
1 HQUSA Aviation Sys Cmd, St Louis, ATTN: AMSAV–ZDR
2 USA Aviation Sys Test Act., Edwards AFB, ATTN: SAVTE–T
1 USA Air Def Sch, Ft Bliss, ATTN: ATSA TEM
1 USA Air Mobility Rsch & Dev Lab, Moffett Fld, ATTN: SAVDL–AS
1 USA Aviation Sch, Res Tng Mgt, Ft Rucker, ATTN: ATST–T–RTM
1 USA Aviation Sch, CO, Ft Rucker, ATTN: ATST–D–A
1 HQ, DARCOM, Alexandria, ATTN: AMXCD–TL
1 HQ, DARCOM, Alexandria, ATTN: CDR
1 US Military Academy, West Point, ATTN: Serials Unit
1 US Military Academy, West Point, ATTN: Ofc of Milt Ldrshp
1 US Military Academy, West Point, ATTN: MAOR
1 USA Standardization Gp, UK, FPO NY, ATTN: MASE–GC
1 Ofc of Naval Rsch, Arlington, ATTN: Code 452
3 Ofc of Naval Rsch, Arlington, ATTN: Code 458
1 Ofc of Naval Rsch, Arlington, ATTN: Code 450
1 Ofc of Naval Rsch, Arlington, ATTN: Code 441
1 Naval Aerospc Med Res Lab, Pensacola, ATTN: Acous Sch Div
1 Naval Aerospc Med Res Lab, Pensacola, ATTN: Code L51
1 Naval Aerospc Med Res Lab, Pensacola, ATTN: Code L5
1 Chief of NavPers, ATTN: Pers-OR
1 NAVAIRSTA, Norfolk, ATTN: Safety Ctr
1 Nav Oceanographic, DC, ATTN: Code 6251, Charts & Tech
1 Center of Naval Anal, ATTN: Doc Ctr
1 NavAirSysCom, ATTN: AIR–5313C
1 Nav BuMed, ATTN: 713
1 NavHelicopterSubSqua 2, FPO SF 96601
1 AFHRL (FT) William AFB
1 AFHRL (TT) Lowry AFB
1 AFHRL (AS) WPAFB, OH
2 AFHRL (DOJZ) Brooks AFB
1 AFHRL (DOJN) Lackland AFB
1 HQUSAF (INYSD)
1 HQUSAF (DPXXA)
1 AFVTG (RD) Randolph AFB
3 AMRL (HE) WPAFB, OH
2 AF Inst of Tech, WPAFB, OH, ATTN: ENE/SL
1 ATC (XPTD) Randolph AFB
1 USAF AeroMed Lib, Brooks AFB (SUL–4), ATTN: DOC SEC
1 AFOSR (NL), Arlington
1 AF Log Cmd, McClellan AFB, ATTN: ALC/DPCRB
1 Air Force Academy, CO, ATTN: Dept of Bel Scn
5 NavPers & Dev Ctr, San Diego
2 Navy Med Neuropsychiatric Rsch Unit, San Diego
1 Nav Electronic Lab, San Diego, ATTN: Res Lab
1 Nav TrngCen, San Diego, ATTN: Code 9000–Lib
1 NavPostGraSch, Monterey, ATTN: Code 55Aa
1 NavPostGraSch, Monterey, ATTN: Code 2124
1 NavTrngEquipCtr, Orlando, ATTN: Tech Lib
1 US Dept of Labor, DC, ATTN: Manpower Admin
1 US Dept of Justice, DC, ATTN: Drug Enforce Admin
1 Nat Bur of Standards, DC, ATTN: Computer Info Section
1 Nat Clearing House for MH–Info, Rockville
1 Denver Federal Ctr, Lakewood, ATTN: BLM
12 Defense Documentation Center
4 Dir Psych, Army Hq, Russell Ofcs, Canberra
1 Scientific Advsr, Mil Bd, Army Hq, Russell Ofcs, Canberra
1 Mil and Air Attache, Austrian Embassy
1 Centre de Recherche Des Facteurs, Humaine de la Defense Nationale, Brussels
2 Canadian Joint Staff Washington
1 C/Air Staff, Royal Canadian AF, ATTN: Pers Std Anal Br
3 Chief, Canadian Def Rsch Staff, ATTN: C/CRDS(W)
4 British Def Staff, British Embassy, Washington
1 Def & Civil Inst of Enviro Medicine, Canada
1 AIR CRESS, Kensington, ATTN: Info Sys Br
1 Militaerpsykologisk Tjeneste, Copehagen
1 Military Attache, French Embassy, ATTN: Doc Sec
1 Medecin Chef, C.E.R.P.A.–Arsenal, Toulon/Naval France
1 Prin Scientific Off, Appl Hum Engr Rsch Div, Ministry of Defense, New Delhi
1 Pers Rsch Ofc Library, AKA, Israel Defense Forces
1 Ministeris van Defehsie, DOOP/KL Afd Sociaal Psychologische Zaken, The Hague, Netherlands